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OF THE

AMERICAN PHILOSOPHICAL SOCIETY,

HELD AT PHILADELPHIA, FOR PROMOTING USEFUL KNOWLEDGE.

VOL. XXIII. APRIL, 1886. No. 123.

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CHAPTER XII.

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1. The candidate shall send his discovery, invention or improvement, addressed to the President, or one of the Vice-Presidents of the Society, free of postage or other charges: and shall distinguish his performance by some motto, device, or other signature, at his pleasure. Together with his discovery, invention, or improvement, he shall also send a sealed letter containing the same motto, device, or signature, and subscribed with the real name and place of residence of the author.

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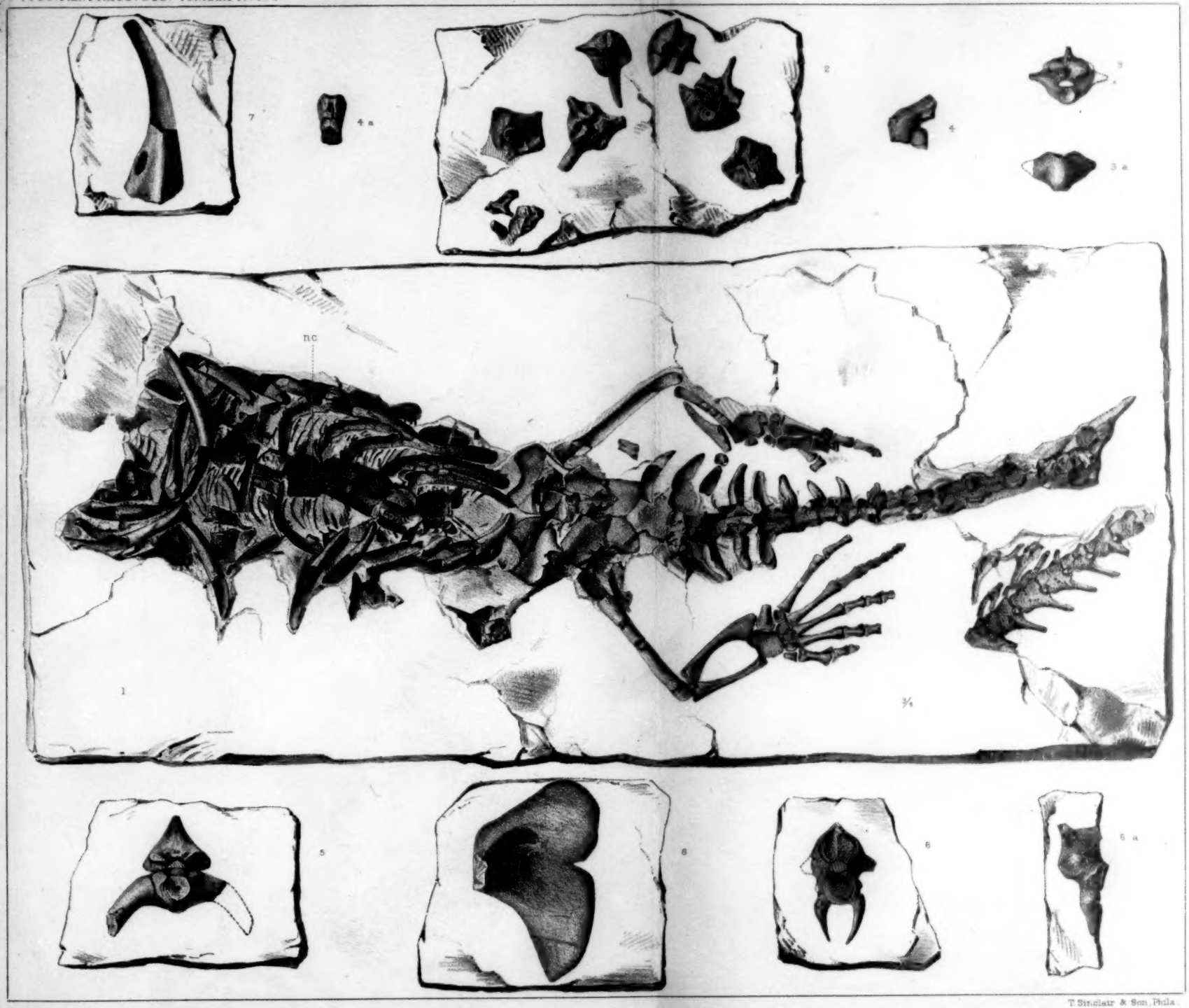
5. All such communications shall be publicly read or exhibited to the Society at some stated meeting, not less than one month previous to the day of adjudication, and shall at all times be open to the inspection of such members as shall desire it. But no member shall carry home with



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VOL. XXIII. APRIL, 1886. No. 122.

MYRIAPODA MUSEI CANTABRIGENSIS, MASS.

PART I. CHILOPODA.

By Fr. Meinert, Copenhagen.

(*Read before the American Philosophical Society, October 2, 1885.*)

Several years since Mr. Alexander Agassiz, the director of the Museum of Comparative Zoölogy, Cambridge, Mass., through Dr. Hermann A. Hagen, offered to place in my hands the Myriapoda of that museum for examination and description. It was thought necessary at the same time to include the Myriapoda of the Museum of the University of Copenhagen, by which the work certainly gained as to completeness, but was on the other hand not a little delayed. When my report on the first part of the Myriapoda, the Chilopoda, was so far advanced that preparations for the press had to be commenced, there arose some difficulty as to a joint publication. I shall therefore begin with the Chilopoda of the Cambridge Museum, while the report upon that class in the Copenhagen Museum will appear in the "Naturhistorisk Tidsskrift," in which the greater part of my previous papers on the Myriapoda are to be found.

In the years 1866–1872, I treated both groups of Myriapoda in a series of essays, in all of which, in regard to the parts of the mouth, I accepted Savigny's explanation and used terms agreeing with it. Subsequently my studies of the different classes of the Arthropoda raised doubts in my mind as to the correctness and propriety of these explanations. Thus I was led to examine the foundation of the whole view of the subject, and when neither Savigny nor any of his school appeared to me to have taken the

right starting point, I rejected the old explanation altogether-and based my views on a more general and, I hope, a more correct explanation of the parts of the mouth. I have, in later years, several times attempted to develop them and to apply them to these organs. At present, I shall limit myself to referring to the last of my essays "Caput Scolopendra," of which both a Danish and an English edition was published in 1883.* In this essay, by means of three plates, I have attempted to demonstrate the propriety of my new views with regard to the Chilopoda in general and Scolopendra in particular. In consequence of this also, several new terms were introduced; but Latzel and Haase had already, by their demonstration of the incorrectness of the explanation of the first and second pair of maxillæ, which Savigny and I also had supported, made some alteration necessary on this point. For the rest such alterations are only made when the old terms refer to an incorrect explanation. No reason was found for altering such terms as *mandible* for example, although formerly I reckoned these organs with the first segment or metamer, and now with the third metamer; for in the true Insects I consider the mandibles to be the third pair of the parts of the mouth. (That the mandibles of the Myriapoda and of the true Insects are not completely homologous is of no importance here).

I will now draw up the two series of terms; the old ones which I have used hitherto, and the new, which I proposed in my lately published "Caput Scolopendræ."

OLD TERMS.	NEW TERMS.
Lamina cephalica.	Lamina cephalica (head-plate).
Labrum.	Labrum (upper lip).
Maxillæ primi paris.	Labium (under lip) p. p.
Maxillæ secundi paris.	Labii processus interiores.
Pedes maxillares primi paris.	Maxillæ *or* palpi maxillares.
Mandibulæ.	Mandibulæ.
Pedes maxillares secundi paris.	Sternum (metameri quarti) cum pedibus prensoriis.
Coxæ (p. maxill.).	Sternum (metameri quarti).
Dentes pedum maxillarium, secundi paris.	Dentes prosternales, seu dentes prosterni metameri quarti.

* The complete title of the English edition is "Caput Scolopendra: The head of the Scolopendra and its musculatory system." With 3 plates. Copenhagen, 1883.

Furthermore, I ought to remark that at present I reckon the "lamina dorsalis" as scutum dorsale to the fourth metamer (the ventral part of which is the raptorial legs or pedes prensorii with their sternum), and the "lamina præbasalis" as scutum dorsale to the third metamer (of which the mandibles are the exponents). In the "Myriapoda Musæi Hauniensis, I. Geophili," p. 9, I have explained the "lamina basalis" in the same manner as here; but there I referred the "lamina præbasalis" to the maxillæ, or the "pedes maxillares primi paris" as I then named them, because the ventral part of the true third metamer was, at that time, quite overlooked, not by me alone, but by all authors. But the alteration of the explanation is no reason for altering the term.

With regard to the classification of the Myriapoda or of the Chilopoda generally, there is but little reason for inquiring into the matter more extensively, particularly as no species of the aberrant genera Scolopendrella, Polyzonium (and Peripatus), are among those which are the object of my present investigations. I will only refer to my previous papers, in which I have strenuously opposed the views of Alex. Brandt, when he regards the genus Scutigera to be a special type of no less systematic value than all the other Chilopods together. For this reason also, I united the Scutigerini and Lithobiini in one single family, the Lithobii, regarding their systematic value as not being greater than that of the Scolopendræ and the Geophili. At present I willingly admit that I have rather exaggerated, in my endeavors to prove the intimate relation between Scutigera and Lithobius, and that I have thus in some degree underrated the systematic value of Scutigera; and, therefore, I prefer now to consider the genus Scutigera to be a separate family, of similar value to the other families of the Chilopoda. But, on the other hand, I must maintain that Scutigera and Lithobius are much more closely related reciprocally, than to either Scolopendra or Geophilus, and therefore I prefer, according to Erich Haase, to unite the four families into two groups, the Anamorpha and the Epimorpha, rather than, according to Latzel, to arrange them into a straight line.

I. Tribus Anamorpha.

Segmenta corporis pedifera 15, inter se inæqualia.

Pedes longi vel longissimi; omnes coxis magnis, manifestis, tarsis bi- vel- multi-articulatis.

Antennæ articulis multis vel plurimis.
Oculi ocellis paucis vel plurimis, aggregatis vel compositis.
Pedes prensorii articulo secundo et tertio manifestis, integris.
Spiraculorum paria nulla vel maxime 6.
Genitalia feminea forcipe externo armata.

Pullus ex ovo nuper exclusus pedum paribus 7 modo instructus.

The tribus Anamorpha thus corresponds with the family Lithobii, as I have proposed this family in "Danmark's Scolopendrer og Lithobier." Naturh. Tidsskr. 3 R., 5 B., p. 246, and the alterations which I have made in the characters here are rather insignificant, although I will remark upon the following.

By the addition of "corporis" to the first characters, I intended to argue that the pedes prensorii or raptorial legs, together with their segment or metamer, cannot be reckoned with the true segments and the true limbs of the body; and I must particularly urge this point, as I have given up the denomination "pedes maxillares" in which an explicit reference to the head was contained. To the second character I have added "omnes coxis magnis, manifestis," by which I maintain that the last pair of legs has large coxæ of the same shape as those of the other legs, and with or without excretorial pores. In the next place I have determined the characters concerning the spiracles more exactly, but for further explanation I must refer to the characters of the family (or genus) Scutigera. The characters concerning the raptorial legs will be treated of more minutely under the second principal group, the Epimorpha. In conclusion I have added the last two characters of Haase.

As to the rest, with regard to my character "tarsis bi- vel-multi-articulatis," I must make the following remark. The typical number of joints of the limbs, both in the Chilognatha and the Chilopoda is seven, and it is thus stated by recent authors,* and particularly by Latzel, in his most valuable work on the Austrian Chilopods.† According to the rule, these seven

* Newport, on the contrary, reckons only six joints in the limbs of the Myriapods, overlooking, or not regarding as a joint the trochanter. "Monogr. Class. Myriap. Trans. Linn. Soc. London," xix, p. 283. Wood has also in this point followed Newport. "Myriap. North Amer. Trans. Amer. Phil. Soc.," xiii, p. 141-142.

† "Die Normal zahl der Fussglieder ist sieben," so he writes in spaced types. "Myriap. Oesterr. Ung. Mon., p. 11."

joints are regarded as homologous with corresponding joints of the limbs of the Insects, in this manner:—the first joint is explained to be the coxa, the second the trochanter, the third the femur, the fourth the tibia, and the last three joints to be the tarsus or the foot. (Compare also Latzel, l. c., p. 12.) As far as number goes, this explanation is very excellent, particularly as most insects have the same number of divisions, five, and a great multitude of insects precisely three joints in the foot, but in reality it is very superficial and incorrect. Thus, when we regard the limbs of insects as the props which support the body and carry it over the ground, four divisions are necessary, viz: *the first*, by which the prop is fastened to the body, *i. e.* the coxa; *the second*, which extends the prop beyond the median line of the animal, *i. e.* the femur (and the trochanter); *the third*, by which the body is raised from the ground, *i. e.* the tibia; and *the fourth* which supplies the necessary hold upon the ground, *i. e.*, the tarsus. Yet it will clearly appear that the matter depends on the arrangement and not on the number or the series of the joints; for the number varies not only in the fourth division, the tarsus, but also in the second (the femur). But still, no one has ever regarded the femur as a tibia, when, the trochanter being bipartite, as in many Hymenoptera, the femur became the fourth and not, as is usual, the third joint in the limb, nor the tibia as the first joint of the tarsus, in the same case. Yet of these four divisions, the second is usually divided into two, the fourth into from two to five joints, beside the claw or claws. The third division, the tibia, is unipartite, or whole, in the true Insects, but in the Spiders, it is bipartite, and the joints here are denominated "patella" and "tibia"; so also in the Chilopoda. Among the Chilopoda, however, no genus can prove more clearly than Scutigera that the fifth and fourth joints are of one set, and that the fifth joint cannot be referred to the tarsus, as well as the sixth and the seventh, for in this genus, the fifth and sixth joints are bent into an angle, and are also very different in structure; furthermore, the fifth joint is, like the tibia of the true Insects, formed with distinct, although small, calcars. The two joints of which the tarsus of the Chilopods thus consists, are most frequently separated, more or less distinctly, but often, as in the Geophili and in some Scolopen-

drini (Cryptops), they are coalesced, or on the contrary, as in the Scutigera, they are both divided into a great number of joints. I have already suggested this explanation in "Danmark's Geophiler," where it is said in the diagnosis of the Geophili, l. c. p. 81, "tarsis integris," and immediately after: "Det normale Antal Led i Myriapodernes Been kan antages at vaere syobaacte hos Chilognather og Chilopoder;" with regard to the Scolopendrini and Lithobii (Anamorpha), in "Danmark's Scolopendrer og Lithobier," p. 242 and 244, I have maintained this view, and in the "Myriapoda Musæi Hauniensis, I. Geophili," p. 7, I have reiterated my former explanation of the limbs of the Geophili. In the following table, I will set forth the terminology which I shall use in this paper, together with that which some other authors have used.

	1st Joint.	2d Joint.	3d Joint.	4th Joint.	5th Joint.	6th–7th Joint
Newport,	Coxa,	. . . . .	Femur,	Tibia,	Tarsus,	Metatarsus.
L. Koch,*	1. Hüftenglied,	2. Hüftenglied,	Oberschenkel.	Unterschenkel,	1 Tarsalglied [da,	2-3 Tarsalglied.
Torath,†	Coxa,	. . . . .	Femur,	Tibia prima	Tibia secun-	Tarsus.
Latzel,	Hüfte,	Schenkelring,	Schenkel,	Schiere,	1 Tarsalglied	2-3 Tarsalglied.
Author,	Coxa,	Trochanter,	Femur,	Patella,	Tibia,	Tarsus.

With regard to the denominations of Newport, I will call to mind a correction, which, for the rest, Newport himself has made in the second part of his monograph, saying, l. c., p. 351, footnote:

"In the first part of this paper, page 283–4, the joint that articulates with the tibia has been described by a mistake as the *metatarsus* instead of the *tarsus*, and the remaining joints as *tarsal* instead of *metatarsal*."

In the dissertation "Schlesiens Chilopoda I. Chilopoda anamorpha," 1880, Haase seems to have followed me, at least, he says in the character of his subordo prior, the Chilopodo anamorpha, "tarsis bi- vel multi-articulatis," l. c., p. 6, but in the paper published immediately afterward, "Beiträge zur Phylogenie und Ontogenie der Chilopoden," he must have joined Latzel's side, for he says, l. c., p. 11, "Die Beine der Chilopoden lassen sich stets auf das typische Insectenbeine zurückführen

* "Die Myriapodengattung Lithobius," 1862.
† "Myriapoda Africæ australis, in Musæo Regio Holmiensi asservata," 1872.

und bestehen normal wie dieses aus Coxa, Trochanter, Femur, und einem 3-gliedrigen Tarsus."

1. Fam. SCUTIGERINI.

Laminæ dorsales alternæ manifestæ, in medio incisæ, alternæ evanidæ.
Pedes longissimi, tarsis multi-articulatis, unguis singuli, processus binis setiformibus instructi.
Antennæ setaceæ, articulis plurimis compositæ.
Oculi ocellis plurimis compositi.
Spiracula nulla. Stomata septem.
Palpi maxillares quadriarticulati ungue nullo.
Laminæ dorsales segmenti septimi atque octavi coalita.
Sternum metameri quarti bipartitum ; setis octo longis armatum.
Coxæ pedum posteriorum simplices (poris execretoris nullis).

The fifteen segments of the body have each one pair of limbs and differ but very little among themselves with regard to the size of the laminæ ventrales ; but, on the contrary, the difference between the dorsal part of the segments is very great, the laminæ dorsales of six segments, i. e., the 2d, 4th, 6th, 9th, 11th and 13th, not being fully developed, but only represented by a membranous fold which is attached to the front edge of the lamina dorsalis of the following segment, while the laminæ dorsales of the eighth and ninth segments coalesce into a common large plate. Thus the number of distinct, well-developed segments in the Scutigerini is only eight. With regard to the second family of this tribus, the Lithobiini, I must remark that the same six laminæ dorsales, which in the Scutigerini are evanescent, in the Lithobiini become abruptly smaller than the remaining laminæ, while the two large well-defined laminæ dorsales of the seventh and eighth segments in the Lithobiini correspond with the large coalesced lamina of the same segments in the Scutigerini.

The posterior edge of the first seven well-developed laminæ dorsales is deeply excavated in the median line, and in this excavation a narrow chitinous ring encloses the orifice (stoma) of a duct into which a number of glandular tubes open from both sides. A controversy of some length has lately taken place with regard to the function of these stomata and of the glandular organs situated behind them, which are either supposed to be spiracles and tracheæ, or regarded only as mere glands. The second view has been several times supported by the author, and I will only refer to my last paper in the controversy: "De

formeentlige Aarde draetsredskaber og deres Mundinger (Stomata) hos Slaegten Scutigera " ("The supposed respiratory organs and their orifices (stomata) in the genus Scutigera"). Vid. Medd. Naturh. Foren. Kjobenhavn, 1882, p. 88.

At present, I will only point out that the number of stomata is seven, and that of the pairs of spiracles in Lithobius six, and that if the stomata were homologous with the spiracles in the other Chilopods, certainly the first segment of the body in Scutigera should have spiracles or coalesced spiracles, while that segment in the other Chilopods should be without these respiratory organs.

The limbs are very long, or much elongated, the different joints being all, except the trochanter, elongated, and the last two, the tarsus, being, besides, divided into a great number of little joints. The first seven pairs of legs are nearly of the same length, but each following pair increases in length, and the hindmost pair, particularly in the male, is abruptly elongated into a fine hair. The two joints of the tarsus are each divided into a great number of badly defined little joints, but the length and thickness of the first joint is always greater than that of the second; on the contrary the number of little joints is much greater in the second tarsal joint than in the first, and we find here even four or five hundred such joints (Latzel, l. c., p. 27). The length of these little joints varies very much in the same species, nay, even in the same specimen, and, besides, no established order can be detected, so that we cannot possibly follow Newport, when he makes use of the proportion between the lengths of the first two of these little joints as characters of species. I have found the proportion varying in the same species from 1 : 1 to 1 : 6, but never have I seen the second joint larger than the first; also, in the same specimen, I have found the proportion 3 : 1 in one leg, but 1 : 1 in the other. Without going further, the circumstance that the different authors who have used this character have mentioned a different proportion in the same species demonstrates that the proportion is not so fixed as Newport intimates (l. c., p. 351).

Each leg has a single claw, but this claw has two long setiform processes, which run along the inner side of the claw, from the base; the length of the processes seem to be from one-half to

four-fifths of the length of the claw. The anal legs seem to be clawless.

The antennæ are setiform, very long, and consist of several hundreds of very minute joints, which are, however, united into two or three fully distinguishable principal joints.

The eyes are large, very prominent and composite, the number of ocelli may be some two hundred or more.

In the preceding pages I have already mentioned the want of spiracles.

The palpi maxillaries are long, slender, four-jointed; the first three are furnished on the front edge with long stout bristles. The fourth or last joint has preserved the same shape as the preceding ones, and has not, as in the Lithobiini and the other Chilopoda, taken the shape of a claw. The two halves of the sternum of the (fourth) metamer are not united; each part bears four long stout bristles on the front edge.

The coxæ are all plain, without glands or glandular pores.

The forceps of the female organs of generation consists of a pair of styli, the first joints of which are nearly joined together with the posterior half of their inner edge, while the forward part is separated and often furnished with a small brush of hair at the corner. As these styli are bent against each other, the shape of the forceps and of the sinus between the two styli is altered and therefore no characters of great value can be drawn from this organ.

Most of the characters in use to-day are valueless, except the color and the proportions of the length of the legs and of the antennæ to the body; we seldom find true characters used, but ordinarily the descriptions are drawn now from one part of the body, now from another. Even the characters employed by such accurate observers as Torath and Latzel are partly due either to a fortuitous want, or are characters common to the whole genus. It is evident that a very great number of different species are needed, before we can hope to find the true special characters. Yet it is far from my intention to claim that I have been more fortunate than my predecessors, and although I believe I have shown many deficiencies in the characters in use, I do not mean that I myself have found the right ones; but I also have had too little material and this must be my excuse.

Although the genus Scutigera is very interesting, the different species of the genus are but little so; and the characters which they offer are, as I have just asserted, often very few and without value. Besides, the antennæ and the legs, particularly the anal legs, are excessively fragile and are often wanting, even in living specimens; and thus many of the specimens which are preserved in museums are more or less destitute of the organs from which the chief characters are drawn. Frequently we find specimens deprived of all their external organs. Species founded on such organs are indeed of no great value, but nevertheless they are distinguishable, and I myself have proposed such a new species.

1. Scutigera serratipes.

Scutigera serratipes Gervais, Walckenær Hist. Nat. Ins. Apt. iv, p. 221.

? *Scutigera Templetoni* Humbert, Essai Myriap. Ceylan, p. 8, pl. i, fig. 1, 1a–1b.

Latiuscula, ante et post paulum angustata, convexa (,) livida, vittis duabus lateralibus latissimis griseis mediaque post paulum angustata rufo-livida notata, antennis tarsisque flavis, cingulis patellarum manifestius, tibiarum binis obsoletius cœrulescentibus; manifesto tuberosa, spinulis in dorso (extra lineam mediam glabram) subseriatis granulisque perminutis scabriuscula.

Lamina cephalica fere æque longa ac lata, post late minus profunde impressa, ante canaliculata, sulcis duobus rectis transversis atque sulco singulo antico curvato exarata; alte marginata (,) margine læviuscula, fimbriata.

Antennæ corpore sesqui longiores.

Laminæ dorsales alte marginatæ, margine densissime spinuloso, margine postico in angulum obtusum producto, obscure flexuoso, in medio late sinuato; lamina ultima latiuscula, lateribus paulum flexuosis, sat angustata, post late rotundata, obscure emarginata.

Stomata in æquum porrecta, longa, stomate primo quam linea media laminæ dorsalis manifesto breviore.

Carinæ pedum alte expressæ, densissime spinulosæ.

Pedes paris ultimi tenuissimi, corpore plus duplo longiores (fere 11 : 5); tibia a tarso bene discreta, manifesto clavata, aculeis binis longiusculis, subæqualibus armata.

Forceps feminæ longiusculus, articulo altero quam priore multo breviore (fere 3 : 4).

Long. 35 mm.

Hab. At Pennaculum, South India, Mr. Scudder; the Isle of St. Mauritius, Mr. Pike.

2. Scutigera castanea, n. sp.

Angustiuscula, ante multum, post paulum angustata, valde convexa; castanea, concolor; tuberosa, spinis in dorso medio subseriatis granulisque perminutis dense scabricula.

Lamina cephalica multo longior quam latior (5 : 4), in crucem impressa, margine læviusculo.

Antennæ desunt.

Laminæ dorsales alte marginatæ, margine manifesto crenulato, margine postico in triangulum obtusum producto, in medio late sinuato; lamina ultima lata, lateribus rotundatis, valde angustata, post integra.

Stomata in æquum porrecta, longa, stomate primo quam linea media laminæ dorsalis fere sesqui breviore.

Pedes desunt.

Forceps feminæ longiusculus, angulo interiore articuli prioris longius penicillato.

The type of this species was deprived of all its legs and the antennæ.

Hab. Koolloo, Mr. Carleton (the specimen was found in a box together with the last mentioned species of this genus, Scut. microstoma).

3. Scutigera forceps.

? Selista forceps Raffinesque, Ann. of Nature, i, p. 7.?

Cermatia coleopterata Say, Journ. Acad. Nat. Sc. Philada., ii, p. 5.

Cermatia floridana Newport, Trans. Linn. Soc. Lond., xix, p. 353.

Scutigera floridana Gervais, Walck. Hist. Nat. Ins. Apt., iv, p. 225.

Cermatia forceps Wood, Journ. Acad. Nat. Sc., new ser., v, p. 132.

Wood, Trans. Amer. Philos. Soc. xiii, p. 145, pl. iii, fig. 1, 1a.

? Cermatia Mexicana Saussure et Humbert, Etud. s. Myriap., p. 112, tab. v, fig. 3, 3a, b. p.

Latiuscula, ante vix post paulum angustata, minus convexa vel convexa; supra viridi-lutea, vittis tribus angustis, fuscis vel cœrulescentibus notata, patellis tibiisque cingulis binis cœrulescentibus, per paria sensim latioribus atque manifestioribus ornatis; obscure tuberosa, spinulis sparsis subseriatis (extra lineam mediam longitudinalem lævem) scabriuscula.

Lamina cephalica post late, minus profunde impressa, ante canaliculata, carina media obscuriore in transversum notata, minus alte marginata, margine læviusculo, sparse fimbriato; manifesto latior quam longior (fere 8 : 7).

Antennæ pertenues, corpore plus sesqui longiores (feminæ 11 : 7; mari 5 : 3).

Laminæ dorsales minus alte marginatæ, margine sparse spinuloso, margine postico late rotundato, in medio latissime sinuato ; lamina ultima angustiuscula, lateribus rotundatis, sat angustata, post breviter rotundato, in medio obscure sinuato.

Stomata præter primum in æquum fere porrecta, parva vel mediocria, stomate primo quam linea mediæ laminæ dorsalis bis vel ter (fere 2 : 5), breviore.

Carinæ pedum minus alte expressæ, sparse spinulosæ.

Pedes paris ultimi pertenues, corpore bis vel ter longiores (fere 5 : 2), tibia a tarso bene discreta, obscure clavata, aculeis binis longiusculis, inæqualibus armata.

Forceps feminæ breviusculus, angulo interiore articuli prioris penicillato, articulo altero quam priore multo breviore (fere 3 : 4).

Long. 28 mm.

I have compared typical specimens of Mr. Wood.

Hab. Beaufort, N. C.; Texas, Mr. P. W. Putnam; Boston, Mass., Mr. Corbett (another specimen from Boston was labeled "found Dec'br 27 living in a tobacco store in Boston importing tobacco from the Southern States, perhaps imported").

4. Scutigera Argentina.

Cermatia Argentina Humbert et Saussure, Rev. et Mag. Zool. 2 sér. xxii, p. 202.

Saussure et Humbert, Etud. s. Myriap. p. 113. Tab. v, fig. 2, 2a.

Angusta, ante et post vix angustata, compressa vel compressiuscula; obscure brunnea, pedibus flavis, sanguineo-plagiatis; parum tuberosa, spinulis in series subdigestis scabriuscula.

Lamina cephalica in foveam parum altam impressa, in medio sat profunde canaliculata, sulco transverso, valde arcuato obscure impressa; minus alte marginata, margine lævisculo, sparsissime fimbriato; vix latior quam longior.

Antennæ desunt.

Laminæ dorsales minus alte marginatæ, margine dense crenulato, margine postico rotundate angustato, in medio in angulum acutum inciso; lamina ultima angustiuscula, lateribus rotundatis, angustata, post integra.

Stomata fere propendentia, perparva, stomate primo quam linea media laminæ dorsalis multoties breviore.

Carinæ pedum minus alte expressæ, sparsissime spinulosæ.

Pedes paris ultimi desunt.

Forceps feminæ breviusculus, angulo interiore articuli prioris aculeo penicilloque brevibus armato, articulo altero quam priore paulo breviore.

Long. 18 mm.

Hab. Cordova, Argent., Mr. Davis (one single specimen).

5. Scutigera nigro-vittata, n. sp.

Latiuscula, ante et post paulum angustata, convexiuscula; flava, vittis duabus latis, nigris, lateralibus prætereaque vittis duabus interioribus capiti notata, femoribus patellis tibiisque infra fasciis binis nigris, per paria sensim manifestioribus atque latioribus signatis, stomatibus nigris; obscure tuberosa, spinulis sparsis, in series subdigestis (extra lineam mediam longitudinalem glabram) granulisque perminutis scabriuscula.

Lamina cephalica post profunde impressa, ante canaliculata, sulcis duobus in transversum impressa; minus alte marginata, margine sparsius fimbriato; fere æque longa ac lata.

Antennæ tenues, truncatæ.

Laminæ dorsales minus alte manginatæ, margine densius fimbriato, margine postico sat breviter rotundato, in medio late sinuato; lamina ultima angustiuscula, valde angustata, post brevissime rotundata.

Stomata paulum declivia, parva, stomate primo quam linea media laminæ dorsalis bis vel ter breviore.

Carinæ pedum minus alte expressæ, spinis sparsis vel sparsioribus setisque serratæ.

Pedes paris ultimi desunt.

Forceps feminæ longiusculus, latere interiore articuli prioris sparsius hirsuto, articulo altero quam priore plus sesqui breviore (fere 3 : 5).

Long. 25 mm.

Hab. Panama.

6. Scutigera microstoma, n. sp.

Latiuscula, ante et post paulum angustata, parum convexiuscula; flava, vitta media, lata, gemina, fusca, marginibus laminarum obscurioribus; læviuscula, sparsissime hirsuta, granulis perminutis aspera.

Lamina cephalica post in figuram ypsiliformem obscure impressa, ante leviter sulcata, parum alte marginata, margine sparse, brevius fimbriato; multo longior quam latior (6 : 5).

Antennæ tenues vel pertenues, corpore paulo longiores (fere 11 : 10).

Laminæ dorsales parum alte marginatæ, margine obscure crenulato, margine postico rotundate angustato, in medio late sinuato; lamina ultima angustiuscula lateribus flexuosis, paulum angustata, post latissime rotundata, in medio obscurissime sinuata.

Stomata declivia, parva, stomate primo quam linea media laminæ dorsalis bis vel ter breviore.

Pedes paris ultimi desunt.

Forceps feminæ breviusculus, angulo interiore articuli prioris breviter penicillato, articulo altero quam priore vix breviore.

Long. 21 mm.

Hab. A place 70 miles from Amballa, India, Mr. Carleton (10 specimens); Koolloo, Mr. Carleton (4 specimens in a box together with Scut. castanea).

2. Fam. LITHOBIINI.

Laminæ dorsales omnes manifestæ (alternæ minores), integræ.

Pedes longi, tarsis biarticulatis (in pedibus prioribus sæpe indistincte); ungues bini (in pedibus posticis sæpe singuli), ungue majore processu simplice, parvo armato.

Antennæ articulis multis vel permultis.

Oculi ocellis paucis vel multis, aggregatis.

Spiracula manifesta (sena).

Palpi maxillares triarticulati, ungue armati.

Laminæ dorsales segmenti septimi atque octavi discretæ.

Sternum metameri quarti integrum; prosternum ante integrum vel indentes incisum.

Pori excretorii in coxas quaternas (vel quinas) ultimas intrusi.

For further explanation of the characters of this family I refer to my preceding essays on the Lithobii ("Danmarks Scolopendrer og Lithobier," Naturh. Tidsskr. 3 R. 5 B.,p. 247, and "Myriapoda Musæi Hauniensis ii, Lithobiini," ibid. 3 R. 8 B., p. 281) and to the preceding pages of this paper.

1. Gen. **Lithobius.**

Labrum liberum, in medio profunde incisum, dentatum, lateribus fimbria lata et densa, e laciniis setiformibus, racemosis facta, instructis.

Labium setis racemosis et simplicibus instructum, processibus labii sat magnis.

Palpi maxillares ungue tri- vel quinque-partito armati.

Mandibulæ serie abbreviata setarum minorum, racemosarum pone setas majores crenulatas armatæ.

Oculi ocellis paucis vel multis.

Pedes omnes vel plurimi calcaribus armati, maxime unguibus binis armati.

Genitalium femineorum unguis intus excavatus, integer aut bi- vel trilobus.

The characters which are here given of the genus Lithobius for the most part conform with those I have proposed in Myriap. Mus. Haun. ii, Lithobii, p. 283, and the apparent great difference arises solely from the introduction of my new terminology and from the altered order of the parts of the mouth, both of which my late investigations have made necessary.

Lamina dorsalis 6, 7, 9, 11, 13 angulis productis.

Pedes anales ungue singulo armati.

Pori coxales in series plures digesti.

Genitalium femineorum unguis tripartitus.

Pedum analium coxæ calcare armatæ.

1. Lithobius multidentatus.

Lithobius multidentatus Newport, Trans. Linn. Soc. Lond., xix, p. 365.
Gervais, Walck., Hist. Nat. Ins. Apt., iv, p. 236.
Bothropolys nobilis Wood, Journ. Acad. Nat. Sc., new ser., v, p. 15.
Bothropolys multidentatus Wood, Trans. Amer. Phil. Soc., xiii, p. 152.

Dilute brunneus, plagis binis magnis laminarum dorsalium, capite antennisque præter summam apicem fuscescentibus; robustus vel sat robustus, ante obsolete, post manifesto rugulosus; capite subobcordato, vix latiore quam longiore, sublævi. Antennæ longiores, articulis longis, 20–22 articulatæ.

Oculi ocellis 20–30, in series 4–6 digestis.

Dentes prosternales septeni vel octoni.

Pori coxales numerosi, in series 3–4 subdigesti.

Pedes corporis primi paris calcaribus 2, 2, 1; pedes anales calcaribus 1, 3, 2, 1 armati.

Pedes postici sat longi.

Genitalium femineorum unguis latus, manifesto tripartitus, aculeis interioribus quam exterioribus multo brevioribus.

Long. 22–25 mm.

Hab. Warwick, Mass. (3 typical specimens of Dr. Wood); Marlow, N. H.; near to the Mammoth Cave, Ky., Mr. Putnam; Michigan, Mr. E. P. Putnam.

Lamina dorsalis 7, 9, 11, 13 angulis productis.

Pedes anales ungue singulo armati.

Pori coxales pauciores, in seriem singulam digesti.

Pedes penultimi unguibus binis armati.

Pedum analium coxæ calcare singulo, parvo armatæ.

2. Lithobius Latzelii, n. sp.

Castaneus vel rufo-brunneus, laminis ventralibus pedibusque flavescentibus; robustus, sublævis, capite lato, multo latiore quam longiore (fere 4 : 3), vix punctato. Antennæ breviusculæ, paulum attenuatæ, 34-articulatæ.

Oculi ocellis 45–48, in series 8–9 obliquas digestis.

Dentes prosternales octoni.

Pori coxales 5, 7, 6, 4—5, 6, 6, 5, magni, plerique transversales.

Pedes corporis primi paris calcaribus 2, 3, 1; pedes anales calcaribus 1, 3, 3, 2 armati.

Pedes postici breviusculi, vix inflati.

Long. 23 mm.

Mas: Pedum analium femur patellaque infra sulco longitudinali excavata.

Hab. Crandall, Virginia.

Lamina dorsalis 9, 11, 13 angulis productis.
Pedes anales ungue singulo armati.
Pori coxales pauciores, in seriam singulam digesti.
Pedes penultimi unguibus binis armati.
Pedum analium coxæ calcare nullo.

3. Lithobius forficatus (Linn.).

Lithobius forficatus Newport, Trans. Linn. Soc. Lond., xix, p. 367.
Lithobius Americanus Newport, ibid, xix, p. 365, tab. xxxiii, fig. 29.
Lithobius multidentatus Wood, Journ. Acad. Nat. Sc., new ser., v, p. 13.
Lithobius Americanus Wood, ibid., p. 14.
Wood, Trans. Amer. Phil. Soc., xiii, p. 148.

Castaneus vel brunneus, laminis ventralibus pedibusque flavis, robustus, sat rugulosus, sæpissime subglaber, interdum hirsutulus, præsertim post, capite magno, subquadrato. Antennæ sat longæ, 36–48-articulatæ.
Oculi ocellis 22–35, in series 5–8 digestis.
Dentes prosternales quini vel septeni.
Pori coxales 6, 6, 6, 5—12, 10, 9, 8, plerique transversales.
Pedes corporis primi paris calcaribus 2, 3, 2; pedes anales calcaribus 1, 3, 3, 2 armati.
Pedes postici longiores, paulum inflati.
Genitalium femineorum unguis trilobus.
Long. 14–26 mm.

For the characteristics of the not fully developed Lithobius forficatus I refer to my Myriap. Mus. Haun., ii, p. 315 and 316, and to the elaborate essay of Latzel, l. c., p. 57; also for the table of synonymys I refer to Ant. Stuxberg, who in his "Lithobioidæ Americæ Borealis" (Ofvers. Kgl. Vet. Akad. Förh., 1875, No. 3, p. 27), gives a list of the synonyms of this animal perhaps complete to his time.

The species is doubtless the most common of all Lithobii in the eastern part of North America, and the Museum of Comparative Zoölogy also possesses numerous specimens not alone from Massachusetts, but also from other places, as Halifax, N. S.; Britain Island, N. S.; Amherst, N. H., Mr. A. M. Edmands; Bee Spring, Ky., Mr. F. G. Sanborn; Anticosti.

Lamina dorsalis 11, 13 angulis productis.
Pedes anales unguibus binis armati.
Pori coxales pauciores, in seriem singulam digesti.
Pedes penultimi unguibus binis armati.
Pedum analium coxæ inermes.

4. Lithobius Cantabrigensis, n. sp.

Flavus, capite paulo obscuriore; gracilis, sublævis, subglaber, capite subobcordato, fere æque longo ac lato. Antennæ breves, 35-articulatæ, articulis perbrevibus.

Oculi ocellis 8, in series 2 digestis.

Dentes prosternales bini.

Pori coxales 2, 3, 3, 2—3, 4, 3, 2.

Pedes corporis primi paris calcaribus 0, 0, 1; pedes anales calcaribus 1, 3, 1, 0—1, 3, 2, 1 armati.

Pedes postici longiusculi, paulum inflati.

Genitalium femineorum unguis trilobus, aculeis brevibus, acutis, interioribus quam exterioribus manifesto brevioribus.

Long. 10.5 mm.

Hab. Cambridge, Mass., Mr. H. H. James.

Laminæ dorsales omnes angulis rectis.

Pori coxales pauciores, in seriem singulam digesti.

Pedum analium coxæ calcare singulo armatæ.

5. Lithobius Jowensis, n. sp.

Brunneus, capite cum antennis obscuriore, laminis ventralibus pallidioribus, pedibus flavis; sat gracilis, sublævis, pedibus densius pilosis, capite subobcordato, manifesto latiore quam longiore (fere 8 : 7). Antennæ breviusculæ, 23-articulatæ, articulis pluribus brevibus.

Oculi ocellis 12–15, in series 3–4 digestis.

Dentes prosternales quaterni.

Pori coxales 4, 5, 5, 4, rotundati.

Pedes corporis primi paris calcaribus 2, 1, 1; pedes paris antepenultimi (pedes anales penultimique desunt) calcaribus 1, 3, 3, 1 armati.

Pedes postici breviusculi.

Genitalium femineorum unguis integer, aculeis minus tenuibus, longitudine subæqualibus.

Long. 13.5 mm.

The specimen which I had to examine was in a bad condition, and particularly the last pairs of legs were lost.

II. Tribus Epimorpha.

Segmenta corporis pedifera pauciora vel numerosa, inter se subæqualia vel æqualia.

Pedes sat longi vel breves, coxis parvis vel evanidis, tarsis integris vel articulatis.

Antennæ articulis paucioribus.

Oculi nulli vel ocellis paucis.

Pedes prensorii articulo secundo atque tertio parvis vel mimis, in latere exteriore evanidis vel interruptis.

Spiraculorum paria segmentis pediferis numero subæqualia, vel saltem 9–10.

Genitalia feminea externa nulla.

Pullus ex ovo nuper exclusus pedibus secundum speciem normatis instructus.

1. Fam. SCOLOPENDRINI.

Segmenta pedifera 21–23, inter subæqualia.

Pedes sat longi, tarsis, saltem ultimis binis, articulatis.

Antennæ 17–30 articulatæ.

Oculi nulli vel ocellis paucis.

(Pedes prensorii articulo secundo atque tertio (sæpissime) in latere exteriore evanidis vel interruptis.)

Lamina basalis sæpissime evanida.

Spiraculorum paria plerumque 9 vel 10.

The number of the joints of the antennæ is seldom more than 22 or 23; yet in some true Scolopendræ, as in Sc. heros, I have found a greater number, and thus I have been compelled to place the limit as high as 30 joints.

As a rule, the second and the third joint of the raptorial legs (pedes prensorii) are very small. Furthermore, regularly the rings of these joints are not whole but interrupted at their dorsal or outermost side; yet, in the genus Cryptops the ring of the third joint is whole, and thus in this genus the dorsal side of the first and of the fourth joint of the raptorial legs is not as in the other genera united or confined.

Gervais, in his tables of the genera of the Scolopendrini, l. c., p. 243, proposes a genus Monops, and in the description of the Cryptops nigra, l. c., p. 294, he retains this name, but without giving a real description of the genus he only indicates that a pair of eyes is found by him. Now it would be of great interest to have a more full investigation of this new genus; I do not dare to say that the eyes are wanting, but on the other hand the family Scolopendrini forms such a compact and distinct group of animals, either wanting eyes, or having them to the number of four pairs, that it is not likely that in this family one species alone would have one pair; and, therefore, I believe that the genus Monops must be in many other characters different from the genus Cryptops, if the eyes in reality exist.

In the lately published genus Plutonium* the number of spi-

* Cavanna, Bull. Soc. Ent. Ital., xiii, p. 169, ff. tab. 1. I have not seen this paper, but, according to Bertkau, the genus seems to relate to Opisthemega.

racles is said to be 19 on each side, but in the other genera no more than 10 pairs are found.

I. *Segmenta pedifera* 23.

1. Gen. **Scolopocryptops.**

Scolopocryptops Newport.* Trans. Linn. Soc. Lond., xix, p. 407.

Lamina cephalica laminam primam dorsalem partim obtegens.

Oculi nulli.

Antennæ tenuiusculæ, subfiliformes, 17 articulatæ.

Labri fimbria longa, intus e setis ad apicem fissis facta.

Labii processus subteretes, barba e setis partim fissis facta instructi; palporum fimbria e setis paulum uncinatis vel clavatis facta.

Palporum maxillarium unguis in latere interiore dentibus 13–15 manifestis armatus; fimbria digitalis unguem procul explens, setis parum uncinatis.

Mandibulæ ante pectinibus 8 juxta et pone lamellam singulum, latam, dentatam coarctatis instructæ.

Metameri quarti sternum integrum, robustum; prosternum parum prominens subtruncatum, vel in angulos breviores productum; pedes prensorii articulo secundo et tertio minimis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula profunda, magna, subrotunda vel breviter ovalia, perpendicularia.

Pleuræ posticæ infra porosæ, in spinam longam post productæ.

Pedes anales elongati, quinquearticulati, articulo primo (femorali) spinigero, ungue minus curvato, subgracili, ad basis unguiculis binis minimis armato.

1. Scolopocryptops sexspinosus.

Cryptops sexspinosus Say, Journ. Acad. Nat. Sci. Philad., ii, p. 112.

Scolopocryptops sexspinosa Newport, Trans. Linn. Soc. Lond., xix, p. 407.
Gervais, Walckenaer Ins. Apt., iv, p. 297.
Wood, Journ. Acad. Nat. Sci. Philad., new ser., v, p. 37.
Wood, Trans. Amer. Phil. Soc., xiii, p. 172.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 54.
Porath, So. Vet. Akad. Handl. Bih., B. 4, p. 26.

Scolopocryptops spinicauda Wood, Journ. Acad. Nat. Sci. Philad., new ser., v, p. 39.
Wood, Trans. Amer. Phil. Soc., xiii, p. 174.

*This name is formed by Newport against the chief rules of nomenclature; yet it has always been received, and therefore I also shall make use of it.

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? *Scolopendropsis helvola* C. L. Koch, Die Myriap., ii, p. 34, tab. lxxvi, fig. 156.

Flavo-brunneus vel rufescens, subtus pallidior, capite cum lamina prima dorsali rubro-castaneo, antennis pedibusque flavis; minus robustus, sublævis; capite manifesto marginato, suborbiculari. Antennæ breviusculæ, breviter parcius hirsutæ, 17 articulatæ, articulis ultimis longis vel perlongis.

Metameri quarti prosterni margo anterior medius manifesto callosus, leviter productus, subrectus vel obscure sinuatus.

Pedes anales glabri, longi, spina inferiore magna, interiore parva.

Laminæ dorsales præter priores in lateribus manifesto marginatæ.

Pleuræ posticæ scabrosæ, poris majoribus atque minoribus, numerosis perforatæ, in spinam robustiorem, breviorem productæ.

Lamina ultima ventralis latiuscula, valde angustata, post subrecta.

Long. 65 mm.

Having compared typical specimens, both of the Sc. sexspinosus and of the Sc. spinicauda Wood, I cannot perceive any true or specific difference between them.

This species is very common and spread over the greater part of North America; I have seen specimens, preserved in the Museum of Comp. Zoöl., from Frederick county, Md., P. R. Uhler; Massachusetts, Miss A. M. Edmands, Cambridge, Mass.; Berkshire, Tioga county, N. Y.; Centre county, Pa., Shaler; Virginia, Crandall; Pennington's Gap, Lee county, Va.; Rosswell, Ga., Mr. King; Yellow Springs, Ohio; Rocky creek, Grayson county, Ky., F. W. Putnam; Macgregor, Iowa, Davis; Ritchie county, W. Va., N. E. Ingersen; San Mateo, Cal., A. Agassiz (Sc. spinicauda, the type of Mr. Wood).

2. Scolopocryptops Georgicus, n. sp.

Fulvus, capite rufescente, pedibus flavis; gracilis, sublævis, capite obscure marginato, subovato. Antennæ subglabræ, breves vel breviusculæ, 17-articulatæ, articulis prioribus transversalibus, anterioribus breviusculis.

Metameri quarti prosterni margo medius obscure callosus, productus, in angulum incisus, dentibus duobus armatus.

Pedes anales glabri, breviusculi, spina inferiore maxima, interiore parva vel perparva.

Laminæ dorsales præter sex priores marginatæ.

Pleuræ posticæ sublæves, integræ, magnam partem obtectæ, in spinam breviorem, acutam productæ.

Lamina ultima ventralis lata, parum angustata, post brevissime sinuata.

Long. 35 mm.

Hab. Georgia; I have seen two specimens.

3. Scolopocryptops Miersii.

Scolopocryptops Miersii Newport, Trans. Linn. Soc. Lond., xix, p. 405.
Gervais, Walckenaer Ins. Apt., iv, p. 298.

? Scolopocryptops melanostoma Newport, Trans. Linn. Soc. Lond., xix, p. 406.

? Scolopocryptops melanosoma Gervais, Walckenaer Ins. Apt., iv, p. 298.

Scolopocryptops sexspinosus p.p. Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 54.

Castaneus, subtus fulvus, antennis pedibusque flavis, posterioribus sæpe majorem vel maximam partem cœruleis; robustus, sublævis, capite vix marginato, orbiculari. Antennæ longiusculæ, longius, dense hirsutæ, 17-articulatæ, articulis omnibus longis.

Metameri quarti prosterni margo anterior medius valde callosus, productus, manifesto sinuatus, sinu dentibus duobus majoribus vel minoribus armatus.

Pedes anales longi vel perlongi (maris? manifesto pilosi), spina inferiore maxima, interiore majore vel minore.

Laminæ dorsales præter sex priores atque duas posteriores vel saltem ultimam immarginatæ.

Pleuræ posticæ scabrosæ atque porosæ, in spinam longam, acutam (vel maris? longissimam, acutissimam) productæ.

Lamina ultima ventralis perlata, manifesto angustata, post sat profunde sinuata.

Long. 70 mm.

Hab. This species seems to prefer the more southern parts of North America, and I have also seen other specimens from the larger Islands of West India; from Jeremie, Hayti, Dr. D. F. Wienland; Grande Anse, Hayti, Uhler; Kingston, Jamaica, Garman; Monn (?) Rouge, Martinique, Garman. It is also found in South America.

II. *Segmenta pedifera* 21.

A. Segmentum septimum spiraculis instructum.

2. Gen. **Heterostoma.**

1. Heterostoma trigonopoda.

Scolopendra trigonopoda Leach, Zool. Miscell., iii, p. 36.

Heterostoma trigonopoda Newport, Trans. Linn. Soc. Lond., xix, p. 413.

? Heterostoma sulcidens Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 59, tab. iv, figs. 5–7.

One specimen of this genus, from Monrovia in Africa, is re-

ferred by me to the above named species; but the specimen is so badly preserved, that no further or closer investigations have been possible either of the characters of the genus or of those of the species.

3. Gen. **Branchiostoma.**

Branchiostoma Newport, Trans. Linn. Soc. Lond., xix, p. 411.

Lamina cephalica a lamina prima dorsali partim obtecta.

Oculi ocellis 4.

Antennæ longiusculæ, tenuiusculæ, manifesto attenuatæ, 18–21-articulatæ.

Labri fimbria brevis, setis simplicibus.

Labii processus subconici, barba e setis brevibus, densis, uncinatis facta; palporum fimbria e setis brevibus, densis, uncinatis facta.

Palporum maxillarium unguis in latere interiore dentibus binis longis, acutis armatus; fimbria digitalis setis parum uncinatis, unguem nullo modo explens.

Mandibulæ ante pectinibus 10–12 juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum integrum, sat robustum; prosternum longe prominens, ante in dentes majores incisum; pedes prensorii articulo secundo et tertio minimis, interruptis.

Segmentum septimum spiraculis instructum.

Spiracula sat profunda, magna, subovalia vel post subtriangula, fere perpendicularia; antica abrupte majora minusque profunda.

Pleuræ posticæ infra porosæ, in spinam longam productæ.

Pedes anales elongati, quinquearticulati, articulo primo (femore) spinigero vel inermi, ungue minus curvato, subgracili ad basin unguiculis binis longioribus, rectis armato.

1. Branchiostoma affine.

Branchiostoma affine Kohlrausch, Beit. z. Kenntn. d. Sc., p. 22.

Arch. f. Naturg. Jahrg., 47, p. 68.

Fusco-griseum vel flavum, in dorso medio linea angusta, pallida notatum, pedibus antennisque flavis; sat gracile, manifesto sparse punctatum, laminis ventralibus integris, capite subovali, immarginato. Antennæ breviusculæ, 18-articulatæ, præter articulos ternos priores dense, brevissime hirsutæ, articulis mediis longiusculis.

Dentes prosternales quaterni, obtusi, per paria approximati, exteriores minores vel evanidi; dens coxalis obsolete trilaciniatus.

Pedes anales perlongi, graciles, in latere interiore femoris spinis parvis 3–5 in seriem singulam, in latere inferiore spinis 4–7 in series binas digestis armati.

Laminæ dorsales quatuor priores omnino, 5–7 fere immarginatæ, ceteræ manifesto marginatæ.

Pleuræ posticæ sublæves, porosæ, in angulum longe productum, spinis ternis parvis armatum desinentes, in latere postico obliquo spina singula armatæ.

Lamina ultima ventralis angustiuscula, rotundate angustata, post manifesto sinuata.

Long. 62 mm.

Hab. Pegu, Burmah, C. H. Carpenter; 70 miles from Ambala, E. India, Mr. Carleton; Mauritius, Mr. Pike; Zanzibar, Mr. C. Cooke; and also Basseterre, St. Cristophori.

2. Branchiostoma celer.

Branchiostoma celer Humbert et Saussure, Rev. et Mag. Zoöl., 2 ser., xxii, p. 202.
Saussure et Humbert, Etud. s. Myriap., p. 122, tab. vi, fig. 16, etc.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 69.

Viride vel viridi-olivaceum, subtus flavo-brunneum vel ochraceum, pedibus præter posteriores antennisque præter articulos ternos priores vel totis flavo-brunneis; sat gracile vel robustius, sublæve, capite suborbiculari, immarginato, margine postico plus vel minus obtecto. Antennæ breviusculæ, 20-(18–21-)articulatæ, præter articulos ternos priores dense, breviter hirsutæ, articulis mediis longis vel longiusculis.

Dentes prosternales quaterni, per paria paulum approximati, obtusiusculi; dens coxalis sublævis.

Pedes anales perlongi, graciles, inermes.

Laminæ dorsales præter quatuor priores marginatæ.

Pleuræ posticæ manifesto scabrosæ, dense porosæ, in angulum lævem, acutum, spinis binis armatum productæ.

Lamina ultima ventralis latiuscula, rotundate angustata, post manifesto sinuata.

Long. 70 mm.

Hab. Kingston, Jamaica, Mr. Garman; Polvon, Occidental Dept. Nicaragua, Mr. McNiel.

B. Segmentum septimum absque spiraculis.

4. Gen. **Otostigma.**

Otostigmus Porath, Sv. Vet. Akad. Handl. Bih., B. 4, p. 18.
Branchiotrema Kohlrausch, Beitr. z. Kenntn. d. Scol., p. 22.
Arch. f. Naturg. Jahrg., 47, p. 70.

Lamina cephalica a lamina prima dorsali partim objecta.

Oculi ocellis 4.

Antennæ longiusculæ, crassiusculæ, manifesto attenuatæ; 18–23-articulatæ.

Labri fimbria brevis, setis paucioribus, simplicibus.

Labii processus subteretes, barba e setis brevibus, densis, uncinatis facta; palporum fimbria e setis brevibus, densis, uncinatis facta.

Palporum maxillarium unguis in latere interiore dente singulo, longo, acuto armatus; fimbria digitalis setis parum uncinatis, unguem superans.

Mandibulæ ante 10–12 juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum integrum, robustum; prosternum longe prominens, ante in dentes magnos incisum; pedes prensorii articulo secundo et tertio minimis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula sat profunda, magna, subovalia vel post subrotunda, obliqua, per paria sensim magis perpendicularia, antica abrupte majora minusque profunda.

Pleuræ posticæ infra porosæ, in spinam longam post productæ; vel truncatæ.

Pedes anales elongati vel valde elongati, quinquearticulati, articulo primo (femore) spinigero vel inermi, ungue minus curvato, subgracili, ad basin unguiculis binis parvis, subrectis armato.

1. Otostigma Luzonicum.

Branchiotrema Luzonicum, calcitrans, ? astenon Kohlrausch, Beitr. z. Kenntn, d. Scol., p. 23.

Arch. f. Naturg. Jahrg., 47, p. 73 and 72.

Ochraceum, plus vel minus olivaceum, antennis pedibusque flavescentibus; subgracile vel gracile, laminis dorsalibus sulcis pluribus plus vel minus manifestis exaratis, laminis ventralibus ad latera profunde bisulcatis, in medio obscure bifoveolatis vel sulcatis; capite subovali, post truncato. Antennæ longiusculæ, ad basin paulum incrassatæ, 18-articulatæ, præter articulos binos vel ternos priores manifesto hirsutæ articulis breviusculis vel brevibus.

Dentes prosternales quaterni majores, per paria approximati (exteriore sæpe evanidi); dens coxalis in latere carinatus.

Pedes anales longi, graciles, teretes, in margine sup. interiore femoris spinis binis minoribus, uniseriatis, angulo apicali evanido spina singula minore instructo, in latere interiore spinis ternis minoribus, uniseriatis, in margine inf. interiore spinulis binis majoribus uniseriatus, in margine exter. inferiore spinulis ternis majoribus uniseriatis armati.

Laminæ dorsales præter sex priores marginatæ.

Pleuræ posticæ sat amplæ, compressiusculæ, sublævres, sparsius, grossius porosæ, in angulum longum, trifidum, in latere superiore spinula parva singula, in latere exteriore interdum spinula parva instructum pro-

ductæ, margine postico in obliquum levissime sinuato, spinula minore armato.

Lamina ultima ventralis latiuscula, lateribus rotundatis, valde convergentibus, post manifesto sinuata.

Long. 45 mm.

Hab. Koolloo Valley, East India, Mr. Carleton (4 spec.).

2. Otostigma carinatum.

Otostigmus carinatus Porath, Sv. Vet. Akad. Handl. Bih. B. 4, p. 20.
Branchiotrema multicarinatum Kohlrausch, Beitr. z. Kenntn. d. Scol., p. 22, fig. 5.
Arch. f. Naturg. Jahrg., 47, p. 71, tab. v, fig. 12.

Ochraceum vel fusco-griseum, capite cum lamina prima atque ultima dorsali brunneo; subgracile, laminis dorsalibus prioribus (2–7) sublævibus, mediis atque posterioribus plus vel minus manifesto septemcarinatis, ad latera rugulosis, laminis ventralibus obscure bisulcatis, capite subcordiforme, lateribus manifesto marginatis, post truncato. Antennæ longiusculæ, ad basin paulum incrassatæ, 20–23-articulatæ, præter articulos binos vel ternos priores hirsutæ, articulis pluribus vel omnibus breviusculis vel brevibus.

Dentes prosternales quaterni, majores, per paria approximati; dens coxalis in latere nodulis ternis parvis instructus.

Pedes anales perlongi, pergraciles, in margine sup. interiore femoris spinulis minutis, sæpissime ternis, angulo apicali non producto spinula singula minuta instructo, in latere interiore spinulis 2–6 minutis, in series binas digestis, in latere inferiore spinulis 4–8 parvis, in series binas digestis armati.

Laminæ dorsales præter quatuor vel sex priores marginatæ.

Pleuræ posticæ sat amplæ, compressiusculæ, densius, grossius porosæ, in angulum longum, ad apicem spinulis ternis vel quaternis minoribus instructum productæ, margine postico in obliquum subtruncato, spinulis binis minoribus armato; anguli pleurarum plus vel minus approximati.

Lamina ultima ventralis latiuscula, lateribus valde rotundatis, valde convergibus, post manifesto sinuata.

Long. 66 mm.

Hab. Shanghai, Mrs. A. P. Chamberlain.

3. Otostigma occidentale, n. sp.

Ochraceum, ante et post plus vel minus virescens, linea media dorsali angusta pallida; subgracile, ante sublæve, post manifesto hirsutum, in lateribus rugulosum, laminis ventralibus sublævibus; capite subcordiforme, post truncato. Antennæ longiusculæ, ad basin paulum incrassatæ,

21-articulatæ, præter articulos binos vel ternos priores manifesto hirsutæ, articulis breviusculis.

Dentes prosternales terni vel quaterni minores, acutiusculi ; dens coxalis acutiusculus, simplex.

Pedes anales longiusculi, vix incrassati, articulis binis prioribus vix clavatis, femore inermi, post restricto.

Laminæ dorsales præter 12–13 priores marginatæ.

Pleuræ posticæ amplæ, sparse grossius porosæ, area antica glabra, majore, angulo apicali nullo, margine postico leviter arcuato.

Lamina ultima ventralis angustiuscula, lateribus rotundatis, valde convergentibus, post obscure sinuata.

Long. 45 mm.

The spiracles of this species are much smaller than the spiracles of most other species of the genus ; yet, as to their construction, they all conform with the scape which ordinarily is found in Otostigma. Also with regard to the pedes anales and to the pleuræ, this is not a little different from the two others here described, perhaps, a new genus ought to be formed.

Hab. Grande Anse, Hayti, Mr. Uhler.

5. Gen. **Cupipes.**

Cupipes Kohlrausch, Beitr. z. Kenntn. d. Scol., p. 23.
Arch. f. Naturg. Jahrg., 47, p. 78.

Lamina cephalica a lamina prima dorsali partim obtecta ; scuta dorsalia metameri tertii manifesta.

Oculi ocellis 4.

Antennæ breviusculæ, crassiusculæ, manifesto attenuatæ, 17-articulatæ.

Labri fimbria longa, setis paucioribus, simplicibus.

Labii processus subteretes, barba e setis brevibus, densis, uncinatis facta; palporum fimbria e setis brevibus, densis, uncinatis facta.

Palporum maxillarium unguis in latere interiore dentibus binis longis, acutis armatus ; fimbria digitalis, setis uncinatis, ad apicem dentatis, unguem longe superans.

Mandibulæ ante 13 pectinibus juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum integrum, minus robustum ; prosternum longe prominens, ante in dentes magnos incisum ; pedes prensorii articulo secundo et tertio parvis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula profunda vel sat profunda, parva vel minima, subtriangula, priora longitudinalia, posteriora per paria sensim brevius triangula vel rotundata, minus profunda, magnitudine decrescentia.

Pleuræ posticæ infra porosæ, truncatæ.

Pedes anales breves vel perbreves, deplanati, quinquearticulati, articulo

primo (femore) spinigero, ungue crasso, parum arcuato, absque unguiculis, infra carina longa, densissime crenulata instructo.

1. Cupipes ungulatis, n. sp.

?? *Cormocephalus Brasiliensis* Humbert et Saussure, Rev. et Mag. Zool., 2 ser., xxii, p. 203.
Etud. s. Myriap., p. 124, tab. vi, fig. 17, etc.

Flavus, ante et post fulvescens; sat gracilis, sparse, brevissime hirsutus, laminis dorsalibus posteribus præter sulcos ordinarios sulcis binis obsoletis, laminis ventralibus sulcis binis profundis exaratis; capite subovali, immarginato, obsolete longitudinaliter bisulcato, post in transversum arcuato, sulcato. Antennæ breviusculæ, tenuiusculæ, paulum attenuatæ, 17-articulatæ, præter articulos senos vel octonos priores dense, breviter hirsutæ, articulis breviusculis, subteretibus.

Dentes prosternales bini (interiores bifidi vel trifidi, exteriores minores, acuti); dens coxalis sat magnus, acutiusculus, nodulis binis in latere armatus.

Pedes anales breves vel perbreves, percrassi, fere contigui, in latere sup. interiore femoris spinulis ternis parvis, in seriem arcuatam digestis, in latere interiore spinulis quaternis parvis vel perparvis, in series binas digestis, in latere inter. inferiore spinulis binis parvis vel perparvis, uniseriatis, in latere inferiore sæpe spinulis binis armati; articulus priore tarsali infra nodo majore instructo.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ angustæ, subrugosæ, porosæ, truncatæ, in angulo interiore spinula perparva, nodiformi armatæ.

Lamina ultima ventralis latiuscula, lateribus rotundatis, manifesto convergentibus, post rotundate truncata.

Long. 40 mm.

Hab. Grande Anse, Hayti, Mr. P. R. Uhler; Port au Prince, Mr. W. Wilson; Pernambuco.

2. Cupipes quadrisulcatus, n. sp.

Purpurascente-olivaceus, capite rufescente, pedibus antennisque flavescentibus; minus robustus, laminis dorsalibus medis manifesto quadrisulcatis, anterioribus et posterioribus obsoletius exaratis, laminis ventralibus mediis profunde, anterioribus atque posterioribus obsolete bisulcatis. Antennæ breves, crassæ, attenuatæ, 17-articulatæ, ad apicem obsolete hirsutæ, articulis brevibus vel breviusculis.

Dentes prosternales bini (interiores truncati e ternis confluentes); dens coxalis minus productus, acutiusculus.

Pedes anales perbreves, percrassæ, contiguæ, in margine interiore femoris post spinulis ternis perparvis, in latere sup. interiore spinula singula perparva armati.

Laminæ dorsales præter undecim priores (obsolete) marginatæ.

Pleuræ posticæ angustæ, subrugosæ, porosæ, rotundate truncatæ.

Lamina ultima ventralis lata, brevis, valde angustata, post rotundate truncata.

Long. 40 mm.

Hab. Ascension Island, South Sea (one single specimen).

6. Gen. **Rhoda**, n. gen.

Lamina cephalica a lamina prima dorsali partim obtecta.

Oculi ocellis 4.

Antennæ breviusculæ vel breves, ad basin incrassatæ, valde attenuatæ, 19-articulatæ, articulis præter ultimum brevibus vel perbrevibus, prioribus transversalibus.

Labri fimbria....

Labii processus...,

Palporum maxillarium unguis in latere interiore dentibus binis longis-acutis armato; fimbria digitalis....unguem medium procul complens.

Mandibulæ....

Metameri quarti sternum integrum, robustum; prosternum perlonge productum, ante in dentes magnos incisum; pedes prensorii articulo secundo et tertio parvis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula profunda, longa, linearia vel paulum triangula, longitudinalia, per paria sensim longitudine paulum decrescentia.

Pleuræ posticæ infra porosæ, truncatæ.

Pedes anales breves vel perbreves, deplanati, quinquearticulati, articulo primo (femore) spinigero, ungue crasso, parum arcuato, absque unguiculis, infra carina longa, densissime crenulata instructo.

As I have had but one single specimen of this new genus to study, I have not been able to give such full characteristics as I wished.

1. Rhoda Thayeri, n. sp.

Flava, ante et post paulum fulvescens; minus gracilis, sublævis, laminis dorsalibus atque ventralibus profunde bisulcatis, capite subovali, immarginato. Antennæ breves, crassæ, 19-articulatæ præter articulos senos priores dense, brevissime hirsutæ, articulis præter ultimum brevibus.

Dentes prosternales terni, validi, truncatæ; dens coxalis productus acutiusculus.

Pedes anales breves, crassæ, contiguæ, in margine sup. interiore femoris spinulis ternis (postica majore, bicuspide) in latere interiore spinulis binis perparvis, in margine inf. interiore spinulis binis parvis armati.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ angustæ, subrugosæ, porosæ, truncatæ.

Lamina ultima ventralis longa, angusta, paulum angustata, post late arcuata.

Long. 58 mm.

Hab. Santarem, Thayer Exped.

7. Gen. **Asanada,** n gen.

Lamina cephalica libera vel a lamina prima dorsali partim obtecta.

Oculi ocellis 4.

Antennæ perbreves, ad basin incrassatæ, valde attenuatæ, 17-articulatæ, articulis brevibus vel perbrevibus, prioribus transversalibus.

Labri fimbria brevis, maxime obtecta, setis paucioribus simplicibus.

Labii processus breves, subconici, barba evanida; palporum fimbria e setis perbrevibus, sparsis, uncinatis facta.

Palporum maxillarium unguis simplex; fimbria digitalis brevis, setis paucioribus, uncinatis, ad apicem dentatis, unguem medium procul complens.

Mandibulæ ante 12 pectinibus juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum in medio canaliculatum, robustum; prosternum longe prominens, ante in dentes majores incisum; pedes prensorii articulo secundo et tertio perparvis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula sat profunda, perparva, producte triangula, longitudinalia, per paria sensim longitudine paulum descrescentia.

Pleuræ posticæ læves, magnam partem obtectæ, truncatæ.

Pedes anales breves, crassi, paulum complanati (mari perbreves, percrassi, deplanati), quinquearticulati, articulo primo (femore) inermi, ungue brevi, crasso, parum arcuato, simplice.

1. Asanada brevicornis, n. sp.

Flava vel fulva, subtus pallidior; gracilis, lævis, laminis dorsalibus bisulcatis, anterioribus obsolete, mediis atque posterioribus manifesto, laminis ventralibus manifesto bisulcatis, capite subovato, immarginato. Antennæ perbreves, ad basin incrassatæ, valde attenuatæ, 17-articulatæ, subnudæ, articulis prioribus transversalibus.

Dentes prosternales terni, acuti (mediis maximis); dens coxalis parvus, acutiusculus.

Pedes anales breves, crassi, paulum complanati, ad basin distantes (maris perbreves, percrassi, deplanati, supra profundissime sulcati, fere contigui), inermes.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ triangulæ, læves, perparvæ, fere obtectæ, truncatæ.

Lamina ultima ventralis lata, brevis, lateribus rotundatis, valde convergentibus, post breviter rotundata.

Long. 35 mm.

Hab. Koolloo, Mr. Carleton.

8. Gen. **Scolopendra.**

Scolopendra Newport, Trans. Linn. Soc. Lond., xix, p. 377.

Lamina cephalica laminam primam dorsalem partim sæpissime obtegens.

Oculi ocellis 4.

Antennæ plerumque longiusculæ, tenuisculæ, ad basin manifesto incrassatæ, attenuatæ, 17–30-attenuatæ, articulis plerisque longiusculis vel longis.

Labri fimbria longa, setis plus vel minus densis, simplicibus.

Labii processus subconici, barba e setis brevibus, densis, uncinatis facta; palporum fimbria e setis brevibus, densis, manifesto uncinatis facta.

Palporum maxillarium unguis in latere interiore dentibus binis validis, acutiusculis armatus; fimbria digitalis brevior, setis longis, densis, parum uncinatis, unguis basin plus vel minus superans.

Mandibulæ ante 10–13 pectinibus juxta et pone lamellam dentatem coarctatis instructæ.

Metameri quarti sternum integrum, robustum; prosternum longe prominens, in dentes majores vel minores incisum; pedes prensorii articulo secundo et tertio parvis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula sat profunda, magna, angusta, post paulum dilatata, longitudinalia, per paria longitudine decrescentia.

Pleuræ posticæ sat amplæ, infra porosæ, post in angulum plus vel minus productum desinentes.

Pedes anales plerumque longiusculi vel longi, rare incrassati, quinque-articulati, articulo primo (femore) sæpissime spinigero, ungue sat magno, minus curvato, ad basin unguiculis binis armato.

Conspectus speciorum:

I. Femora pedium penultimorum (saltem) ad apicem exteriorem spinulis armata.
  A. Lamina prima marginem pone dorsalis anticum profunde sulcatum in transversum.
    1. *Sc. gigas.* 2. *Sc. cristata.* 3. *Sc. prasina.*
  B. Lamina prima dorsalis integra.
    4. *Sc. alternans.* 5. *Sc. crudelis.*

II. Femora pedum penultimorum ad apicem exteriorem inermia.
  A. Lamina prima dorsalis pone marginem anticum in transversum profunde sulcatum.
    a. Pedum ultimorum articulus primus tarsalis calcare armatus.
    6. *Sc. heros.* 7. *Sc. viridis.*
    b. Pedum ultimorum articulus primus tarsalis inermis.
    8. *Sc. occidentalis.* 9. *Sc. Woodii.*
  B. Lamina prima dorsalis integra.
    a. Pedum omnium articulus primus tarsalis inermis.

10. *Sc. longispina.* 11. *Sc. Chilensis.*

b. Pedum plerorumque articulus primus tarsalis calcare armatus.

12. *Sc. morsitans.* 13. *Sc. rugosa.* 14. *Sc. subspinipes.* 15. *Sc. De Haanii.* 16. *Sc. Indica.*

I. Femora pedum penultimorum (saltem) ad apicem exteriorem spinulis armata.

A. Lamina prima dorsalis pone marginem anticum in transversum profunde sulcata.

1. Scolopendra gigas.

Scolopendra gigas Leach, Trans. Linn. Soc. Lond., xi, p. 383.
Newport, Ann. and Mag. of Nat. Hist., xiii, p. 98.
Trans. Linn. Soc. Lond., xix, p. 399.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 119.
Scolopendra insignis Gervais, Ann. Soc. entom. de France, p. xxix.
Walckenaer Ins. Apt., iv, p. 278.
Scolopendra gigantea Porat, Soc. Vet. Akad. Handl. Bih., B. 4, No. 7, p. 5.
? Scolopendra gigantea Linné, Syst. Nat., ed. x, p. 638.
Newport, Trans. Linn. Soc. Lond., xix, p. 400.
Gervais, Walckenaer Ins. Apt., iv, p. 279.
Scolopendra prasinipes, epileptica Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 11.

Castanea, subtus pallidior, pedibus prioribus in articulis ternis ultimis sæpissime olivaceo balteatis, antennis viridi-olivaceis; valde robustus, sublævis, laminis ventralibus obscure bisulcatis; capite suborbiculari, immarginato. Antennæ longiusculæ vel longæ, 17–(18-)articulatæ, articulis septenis vel octonis anterioribus dense brevissime gilvo-hirsutæ, articulis præter priores longis.

Dentes prosternales quaterni (bini vel terni interiores maximam partem coaliti), magni; dens coxalis magnus, obtusiusculus, in latere nodulo instructus.

Femora præter prima vel bina priora ad apicem exteriorem spinulis ternis (quinis) armata. Pedum articulus primus tarsalis, pedibus ultimis (analibus) exceptes, calcare armatus.

Pedes anales longiusculi, in latere sup. interiore femoris spinulis majoribus novenis vel duodenis, in series ternas vel quaternas digestis, in angulo exteriore tumido spinulis octonis vel denis, in series binas vel ternas obliquas digestis, in latere inf. interiore spinulis minoribus ternis (binis), in latere inferiore spinulis ternis vel quinis, in series binas digestis, armati.

Laminæ dorsales præter tres vel quatuor priores marginatæ.

Pleuræ posticæ amplæ, sublæves, densissime tenuiter porosæ, in angulum obtusum, spinulis quaternis vel quinis instructum, productæ, margine postico in obliquum fere truncato vel leviter sinuato, inermi.

Lamina ultima ventralis longa, angusta, lateribus sinuatis manifesto convergentibus, post rotundate truncata vel latissime rotundata.

Long. 220–280 mm.

Hab. Santarem, Chas. Linden; Near Santarem, Brazil; Obidos, Brazil, James & Hunnewell (Thayer Exped.); Villa Bella, Brazil, J. C. Hetcher.

2. Scolopendra cristata.

Scolopendra cristata Newport, Ann. and Mag. of Nat. Hist., xiii, p. 98.
Trans. Linn. Soc., Lond., xix, p. 398.
Porat, Sv. Vet. Akad. Handl. Bih., B. 4, No. 7, p. 6.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 117.

Castanea vel olivacea, antennis pedibusque pallidioribus, concoloribus vel partim balteis olivaceis in articulis omnibus vel exterioribus pedum posteriorum plus vel minus manifestis ornatis, robusta, sublævis; capite subovali. Antennæ breviusculæ vel longiusculæ, ad basin multum incrassatæ, 17-articulatæ, præter articulos quaternos priores brevissime hirsutæ, articulis præter priores longiusculis vel longis.

Dentes prosternales quaterni (terni interiores plus vel minus coaliti) magni; dens coxalis in latere nodulo armatus.

Femora terna vel quina posteriora (ante pedes anales) ad apicem exteriorem spinulis binis vel spinula singula armata. Pedum articulus primus tarsalis, pedibus ultimis (analibus) exceptis, calcare armatus.

Pedes anales breviusculi vel breves, incrassati vel crassi, in latere superiore femoris spinulis parvis binis vel spinula singula, in margine sup. interiore spinulis magnis binis vel ternis, angulo apicali in acu forte, acutum, in latere spinulis binis armatum producto, in latere inferiore spinulis senis, in series ternas digestis, armati.

Laminæ dorsales præter quatuor priores marginatæ. Lamina ultima in medio alte carinata.

Pleuræ posticæ sat amplæ, sublæves, densissime tenuiter porosæ, in angulum minorem, ad apicem spinula singula armatum, productæ, margine postico paulum obliquo, subrecto, inermi.

Lamina ultima ventralis breviuscula, angustiuscula, multum angustata, post late rotundata.

Long. 145–175 mm.

Hab. Brazil?, Charles Linden; Amazon river, Brazil, Rev. J. C. Hetcher.

3. Scolopendra prasina.

Scolopendra prasina C. L. Koch, Die Myriap., ii, p. 23, tab. lxxi, fig. 146.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 122.

? Scolopendra puncticeps Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 14.

?? Scolopendra punctiscuta Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 14.

Flava vel flavo-brunnea, laminis dorsalibus præter laminam primam et ultimam in margine postico virescentibus, articulis exterioribus pedum posteriorum virescentibus; sat robusta, tenuiter sparse punctata, laminis ventralibus lævibus; capite suborbiculari. Antennæ breviusculæ ad basin paulum incrassatæ, 17-articulatæ, præter articulos quaternos priores dense gilvo hirsutæ, carinulatæ, articulis breviusculis.

Dentes prosternales quaterni (bini interiores approximati vel coaliti, externi discreti), majores, truncati; dens coxalis in latere nodulo majore instructus.

Femora bina posteriora (ante pedes anales) ad apicem exteriorem spinulis binis, femora antecedentia spinula singula armata. Patellæ binæ posteriores (ante pedes anales) ad apicem exteriorem spinula singula armata. Pedum articulus primus tarsalis, pedibus ultimis (analibus) exceptis, calcare armatus.

Pedes anales breviusculi, sat incrassati, in latere superiore femoris spinulis binis parvis, in margine sup. interiore rotundato spinulis senis majoribus, uncinatis, in margine inf. interiore rotundato spinulis binis minoribus, in latere inferiore spinulis septenis majoribus, in series ternas digestis, armati, in latere interiore articuli sequentis (patellæ) spinulis quaternis minoribus, angulo apicali spinula singula instructo, armati.

Laminæ dorsales præter sex priores marginatæ.

Pleuræ posticæ amplæ, sublæves, densissime tenuiter porosæ, in angulum brevem, spinulis ternis magnis hamatis instructum, productæ, margine postico leviter arcuato, spinula singula armato.

Lamina ultima ventralis breviuscula, latiuscula, multum angustata, post late rotundata.

Long. 90–105 mm.

Hab. Grenada, W. I., Peter Gelliman.

B. Lamina prima dorsalis integra.

4. SCOLOPENDRA ALTERNANS.

Scolopendra alternans Leach, Trans. Linn. Soc., Lond., xi, p. 383.

Scolopendra alternans, Grayi, complanata, incerta, multispinosa (multispinata) Newport, Trans. Linn. Soc., Lond., xix, p. 402–405.

Scolopendra Sagræa Gervais, Walckenaer Ins. Apt., iv, p. 281.

? Scolopendra torquata Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 13.

Flavo-brunnea vel præsertim ante et post castanea, margine postico laminarum dorsalium, antennis vel totis vel solummodo in latere inferiore articulorum priorum articulisque pedum exterioribus interdum obscure virescentibus; robusta vel valde robusta, sublævis, laminis ventralibus sat obscure bisulcatis, capite suborbiculari. Antennæ longiusculæ vel

longæ, ad basin paulum incrassatæ, attenuatæ, 17-articulatæ, præter articulos quinos priores dense brevissime hirsutæ, carinulatæ, articulis longis.

Dentes prosternales terni (interiores lati, obtusi), validi; dens coxalis magnus, obtusiusculus, in latere interiore nodo vel denticulo obtuso armatus.

Femora pedum penultimorum angulo, spinulis quinis vel senis armato, instructa; pedum antepenultimorum ad apicem exteriorem spinulis binis vel spinula singula armata. Pedum articulus primus tarsalis, pedibus ultimis (analibus) exceptis, calcare armatus.

Pedes anales longiusculi, crassiusculi, in latere superiore femoris spinulis ternis vel senis, majoribus vel minoribus, in series binas subdigestis, in latere sup. interiore spinis quaternis vel senis subseriatis, angulo postico acutiusculo spinis septenis vel octonis instructo, in latere interiore spinis senis vel novenis subseriatis vel in series binas digestis, in latere inferiore spinis septenis vel duodenis, in series ternas digestis, armati.

Laminæ dorsales præter quinque vel septem priores marginatæ.

Pleuræ posticæ minus amplæ, sublæves, densissime tenuissime porosæ, in angulum acutiusculum, spinulis senis vel octonis parvis instructum, productæ, margine postico in obliquum subtruncato, paulum flexuoso, in medio atque ad apicem exteriorem spinulis parvis armato.

Lamina ultima ventralis breviuscula, angustiuscula, valde angustata, post rotundate truncata.

Long. 110–170 m.m.

Hab. This species seems to be a very common one in the West India; yet in the collection of the Museum of Comp. Zoöl., I have found only five specimens, viz: from Cuba, Mr. Trey, and also from Brazil.

5. Scolopendra crudelis.

Scolopendra crudelis Koch, Syst. d. Myriap. p. 170]
Die Myriap., ii, p. 36, tab. lxxvii, lxxviii, fig. 158, 159.
Porat, Sv. Vet. Akad. Handl. Bih., B. 4, No. 7, p. 7.
Scolopendra longipes Wood, Journ. Acad. Nat. Sc. Philad., 2 ser., v, p. 26.
Trans. Amer. Philos. Soc., xiii, p. 163.

Castanea vel fulva, antennis pedibusque flavescentibus, margine postico laminarum dorsalium interdum virescente; robusta, sublævis, laminis ventralibus obscure bisulcatis; capite subovali, immarginato. Antennæ longiusculæ vel longæ, ad basin paulum incrassatæ, attenuatæ, 17-articulatæ, præter articulos quinos priores dense brevissime hirsutæ, carinulatæ, articulis longis, teretibus.

Dentes prosternales quaterni (bini interiores coaliti, truncati), validi; dens coxalis magnus, in latere interiore denticulo majore armatus.

Femora pedum penultimorum angulo spinulis quaternis vel senis in-

structo, in latere superiore spinulis parvis ternis vel spinula singula armata; pedum antepenultimorum ad apicem exteriorem spinulis binis armata. Pedum articulus primus tarsalis, pedibus ultimis (analibus) exceptis, calcare armatus.

Pedes anales longi, tenuiusculi, in margine sup. interiore femoris rotundato spinulis majoribus sedenis vel vicenis, in series quaternas subdigestis, nodo apicali sat producto, spinulis septenis vel octonis majoribus instructo, in latere inferiore spinulis tredenis vel quatuordenis, in series ternas digestis, armati.

Laminæ dorsales præter septem priores marginatæ.

Pleuræ posticæ minus amplæ, sublæves, densissime tenuissime (poris majoribus intermixtis) porosæ, in angulum majorem, obtusiusculum, spinulis senis instructum productæ, margine postico in obliquum subtruncato, paulum flexuoso, spinulis binis majoribus armato.

Lamina ultima ventralis brevisucula, latiuscula, valde angustata, post rotundate truncata.

Long. 150 mm.

Hab. Florida, Mr. Wurdemann; Double-headed-shot Key (U. S. Coast Survey. Gulf Stream Exped.); Jeremie, Hayti (F. C. Gray's fund).

II. Femora pedum penultimorum ad apicem inermia.

A. Lamina prima dorsalis pone marginem anticum in transversum profunde sulcata.

a. Pedum ultimorum articulus primus tarsalis calcare armatus.

6. Scolopendra heros.

Scolopendra heros Girard, Marcy Rep. Explor. Red Riv., p. 272, tab. xviii.
Wood, Trans. Amer. Philos. Soc., xiii, p. 155.
Porat, Sv. Vet. Akad. Handl. Bih., B. 4, No. 7, p. 8.

Scolopendra castaneiceps Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 11.
Trans. Amer. Philos. Soc., xiii, tab. i, fig. 7.

Scolopendra polymorpha Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 11.
Trans. Amer. Philos. Soc., xiii, p. 158.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 114.

Scolopendra Copeana Wood, Journ. Acad. Nat. Sc. Phil., 2 ser., v, p. 27.
Trans. Amer. Philos. Soc., xiii, p. 165.

? Scolopendra mysteca Humbert et Saussure, Rev. et Mag. Zool., 2 sér., xxi, p. 157.
Saussure et Humbert, Etud. s. Myriap., p. 130.

? *Scolopendra Azteca, Otomita, Maya, Talteca* Saussure, Mém. Mex. Myriap., p. 124–126, tab. 5–6, fig. 41–43, 45.

Saussure et Humbert, Etud. s. Myriap., p. 128–129, tab. v, fig. 9, 10, 12, 14.

Brunnea vel flavo-olivacea, capite cum lamina prima dorsali plus vel minus rufescente, pedibus antennisque flavescentibus, margine postico laminarum dorsalium sæpe virescente, in medio latius vel manifestus; robusta vel sat robusta, sublævis, laminis ventralibus manifesto bisulcatis; capite suborbiculari, immarginato. Antennæ longiusculæ vel longæ, ad basin paulum incrassatæ, attenuatæ, 24–29 articulatæ, præter articulos senos vel denos brevissime hirsutæ, articulis pluribus anterioribus brevibus vel breviusculis.

Dentes prosternales quaterni (bini vel terni interiores plus vel minus coaliti), majores, obtusi; dens coxalis magnus, acutiusculus, subinermis.

Pedes anales longiusculi vel breviusculi, paulum incrassati, in latere sup. interiore femoris spinulis quaternis vel senis majoribus, in series binas digestis, angulo apicali in nodum longiorem, angustiorem, spinulis ternis vel septenis instructum, producto, in latere interiore spinulis binis vel ternis, in latere inf. interiore spinulis binis vel ternis, in latere inferiore spinulis quaternis vel septenis, in series binas digestis, armati.

Laminæ dorsales præter octo priores marginatæ.

Pleuræ posticæ amplæ, sublæves. dense tenuiter porosæ, in angulum breviorem vel longiorem, obtusiusculum, ad apicem spinulis ternis vel senis instructum, productæ, margine postico sinuato, spinula parva armato.

Lamina ultima ventralis brevis, lata, valde angustata, post subtruncata vel latissime sinuata.

Long. 100–130 mm.

Hab. This species seems to be common through the most parts of North and Central America; thus I have seen specimens from Westfield, N. York; near Mammoth Cave, Ky.; Key West; Alexandria, Ga., Anderson; Seabrook Isl., Ga.; Mobile, Ala.; Springhill, Ala.; Cap Florida, Wurdemann; Galveston, Tex., Boll; Monteviaz, Mex., Palmer; mountain near St. Louis Potosi, Mex., E. Palmer; Panama; Guatemala, Van Patten; Porto Rico, Cardoge; San Diego, Cal.; Guaymas, Gulf of California; Ft. M'Pherson, Neb.; Riley, Kansas, H. Bravat.

7. Scolopendra viridis.

Scolopendra viridis Say, Proc. Acad. Nat. Sc. Philad., ii, p. 110.

Wood, Journ. Acad. Nat. Sc. Philad., 2 ser., v, p. 22.

Trans. Amer. Philos. Soc., xiii, p. 159.

Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 112.

Scolopendra punctiventris Newport, Ann. and Mag. of Nat. Hist., xiii, p. 100.

Trans. Linn. Soc., Lond., xix, p. 386.

Scolopendra parva Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 10.

Ochracea vel brunnea, lamina cephalica atque vitta lata dorsali sæpe viridibus; sat gracilis, manifesto sparse punctata, laminis ventralibus profunde bisulcatis; capite subrotundata. Antennæ longiusculæ, ad basin sat incrassatæ, angustatæ, 23-24 articulatæ, præter articulos senos priores brevissime hirsutæ articulis pluribus brevibus, longioribus interpositis.

Dentes prosternales quaterni (bini interiores fere coaliti, exteriores magis discreti), minores; dens coxalis sat magnus, obtusiusculus, inermis.

Pedes anales breviusculi, paulum incrassati, in margine sup. interiore femoris rotundato spinulis quaternis majoribus, in series binas digestis, angulo apicali brevissimo, bifido vel spinulis ternis vel quaternis instructo, in latere interiore ante spina singula, in latere inferiore spinulis senis vel octonis, in series quaternas digestis, armati.

Laminæ dorsales præter duodecim vel tredecim priores marginatæ.

Pleuræ posticæ amplæ, dense grossius porosæ, in angulum brevem, spinulis ternis vel quaternis instructum productæ, margine postico leviter sinuato, inermi vel spinula minima armato.

Lamina ultima ventralis longiuscula, angustiuscula, multum angustata, post latissime sinuata.

Long. 60 mm.

Hab. Georgia, A. S. Allanson (an original specimen of this species).

b. Pedum ultimorum articulus primus tarsalis inermis.

8. Scolopendra occidentalis, n. sp.

Ochracea vel brunnea, laminis dorsalibus præter primam atque ultimam plus vel minus virescentibus; subgracilis, sublævis, laminis ventralibus profunde bisulcatis; capite suborbiculari. Antennæ longiusculæ, ad basin valde incrassatæ, attenuatæ, 23-articulatæ, præter articulos quinos vel senos priores obscure hirsutæ, articulis breviusculis.

Dentes prosternales quaterni (bini interiores approximati), majores; dens coxalis mediocris, acutus, inermis.

Pedum articulus primus tarsalis, pedibus binis posterioribus exceptis, calcare armatus.

Pedes anales longi, graciles, in margine sup. interiore femoris spinulis quinis vel septenis minoribus, in series binas digestis, angulo apicali vix prominente, spinulis ternis vel quaternis instructo, in latere interiore spinulis ternis parvis, in latere inferiore spinulis quatuordenis vel sedenis, in series ternas digestis, armati.

Laminæ dorsales præter sedecim priores marginatæ.

Pleuræ posticæ angustiusculæ, subrugosæ, sparse tenuiter porosæ, in an-

gulum longius, ad apicem spinulis quaternis parvis in latere spinula singula instructum, productæ, margine postico leviter sinuato, spinulis binis parvis armato.

Lamina ultima ventralis brevis, lata, valde angustata, post rotundate truncata.

Long. 50 mm.

Hab. West Coast of Mexico, Capt. Goff (a single specimen).

9. SCOLOPENDRA WOODII.

Scolopendra inæquidens Wood, Trans. Amer. Philos. Soc., xiii, p. 162.

Ochracea vel brunnea, antennis laminisque dorsalibus præter primam atque ultimam sæpe olivaceis vel virescentibus, linea media dorsali pallida, obscure marginata; subgracilis, sublævis, laminis ventralibus profunde bisulcatis; capite subovali. Antennæ breviusculæ, ad basin paulum incrassatæ, 17-articulatæ, præter articulos octonos priores manifesto hirsutæ, articulis brevibus.

Dentes prosternales quaterni (bini interiores plus vel minus coaliti), minores; dens coxalis mediocris, ad apicem obscure carinatus.

Pedum omnium articulus primus tarsalis inermis.

Pedes anales breviusculi, sat incrassati, in margine sup. interiore femoris spinulis quinis majoribus, in series binas digestis, angulo apicali in spinam acutum, breviorem, simplicem vel bifidum producto, in latere inferiore spinulis senis vel septenis magnis, in series ternas digestis, armati.

Laminæ dorsales modo tres vel quatuor posteriores marginatæ.

Pleuræ posticæ sat amplæ, rugosæ, sparsius grossius porosæ, in angulum longum, angustum, ad apicem spinis binis vel quaternis instructum productæ, margine postico in obliquum profunde sinuato, inermi.

Lamina ultima ventralis breviuscula, latiuscula, valde angustata, post latissime sinuata.

Long. 60 mm.

Mr. Wood has determined this species as Sc. inæquidens Gervais, but I do not believe that this determination is right, and although the description of Gervais is very incomplete or incertain, yet his original specimen is said to exist in the museum at Paris, and so we may be sure that at some time this same specimen will be more completely described, and then Gervais' name will be attached to another species and not to that of which I am here treating. Therefore it might be better to alter the name at this time, and so I propose the name of Scolopendra Woodii in honor of Dr. Wood, the first man who has made it clear how much the species of Scolopendra vary in the greater part of the characters, which we have been accustomed to believe to be the most characteristic.

Hab. Hilton Head, S. C., Dr. Greene; Beaufort, N. C., J. G. Shute; Pennington's Gap, Lee Co., Va.; I have seen specimens besides from Massachusetts, and other places in the United States.

B. Lamina prima dorsalis integra.

a. Pedum omnium articulus primus tarsalis inermis.

10. SCOLOPENDRA LONGISPINA, n. sp.

Ochracea vel brunnea, supra plus vel minus olivacea, linea media dorsali angusta pallida; subgracilis, sublævis, laminis ventralibus manifesto bisulcatis; capite subovali. Antennæ breviusculæ, ad basin sat incrassatæ, 17–19-articulatæ, præter articulos quaternos vel quinos priores brevissime hirsutæ, articulis breviusculis.

Dentes prosternales quaterni (bini interiores approximati vel coaliti), majores; dens coxalis in latere nodulis binis vel nodulo singulo armatus.

Pedes anales breviusculi, plus vel minus incrassati, in margine sup. interiore femoris supra fere planiusculi spinulis ternis vel quinis majoribus vel magnis, in series binas digestis, angulo apicali in spinam longiorem, bi- vel quadrifidam producto, in latere interiore spinulis quaternes vel septenis majoribus, in series binas digestis, in latere inferiore spinulis septenis vel novenis majoribus, in series binas digestis, ad basin spinulis ternis vel quinis, in seriem obliquam digestis, armati.

Laminæ dorsales modo tres vel sex posteriores marginatæ.

Pleuræ posticæ sat amplæ, subrugosæ, densius grossius porosæ, in angulum longum, angustum, ad apicem spinulis quaternis vel quinis, in latere superiore spinulis binis vel quaternis, in latere exteriore spinulis binis vel spinula singula instructum productæ, margine postico subtruncato, spinula singula minore armato.

Lamina ultima ventralis brevis, perlata, valde angustata, post late rotundata.

Long. 60 mm.'

Hab. Maldonado, Brazil, Mr. T. G. Carey.

11. SCOLOPENDRA CHILENSIS.

? Scolopendra Chilensis Gervais, Walckenaer Ins. Apt., iv, p. 285.

Ochracea, plus vel minus olivacea, pedibus pallidioribus; gracilis, sublævis, laminis ventralibus leviter vel obscure bisulcatis; capite subovali. Antennæ longiusculæ, ad basin paulum incrassatæ, 17–18-articulatæ, præter articulos senos priores breviter hirsutæ, articulis præter priores longiusculis.

Dentes prosternales quaterni (bini interiores approximati), minores; dens coxalis mediocris, simplex.

Pedes anales longi vel elongati, graciles, teretes, in latere interiore

femoris spinulis undenis minoribus, in series ternas digestis, angulo apicali in spinam brevem, bifidam producto, in latere inferiore ad marginem exteriorem spinulis undenis minoribus, in series binas digestis, armati.

Laminæ dorsales modo quatuor vel sex posteriores marginatæ.

Pleuræ posticæ amplæ, subrugosæ, sparsius tenuiter porosæ, in angulum longum, angustam, subteretem, ad apicem spinulis quinque in latere exteriore spinulis binis instructum productæ, margine postico in obliquum subtruncato, spinula singula parva armato.

Lamina ultima ventralis brevis, perlata, valde angustata, post brevius rotundata.

Long. 50 mm.

Dr. Kohlrausch, l. c., p. 125, has suggested that the Sc. Chilensis of Gervais may be a Cormocephalus; in reality the present species very nearly approaches that genus, but the structure of the lamina cephalica does not permit such a reference.

Hab. Zalcuhana, Chili, Hassler Exped.; Cordova, Argent., Mr. Davis.

b. Pedum plerorumque articulus primus tarsalis calcare armatus.

12. SCOLOPENDRA MORSITANS.

Scolopendra morsitans Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 104.

Scolopendra morsitans, angulipes, ? varia, platypoides, tigrina, Leachii, angusta, formosa, longicornis, tuberculidens, Fabricii, ? Richardsonii, Algerina Newport, Trans. Linn. Soc., Lond., xix, p. 378–387.

Scolopendra Gervaisiana, Scopoliana, fulvipes, elegans, erythrocephala, bilineata, ? Togana, platypus Gervais, Walckenaer Ins. Apt., iv, p. 259–280.

Scolopendra carinipes, Californica Saussure et Humbert, Etud. s. Myriap., p. 125–127, tab. v, fig. 6 and 8.

Scolopendra pella, porphyratænia Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 13–15.

Scolopendra morsitans Wood, Trans. Amer. Philos. Soc., xiii, p. 161.

Scolopendra morsitans, ? Scopoliana, Gervaisiana, planipes, infesta C. L. Koch, Die Myriap., i, fig. 33, 34, 46; ii, figs. 179, 180.

Scolopendra picturata, intermedia, cognata, Alfzelii, Leachii, attenuata, pilosella, chorocephala, Wahlbergi, saltatoria Porath, Ofvers. Vet. Akad. Förh., 1871, No. 9, p. 1144–1151.

Scolopendra platypus, longicornis, cognata, impressa Porat, Sv. Vet. Akad. Handl. Bih., B. 4, No. 7, p. 11–13.

Scolopendra Mossambica, ? brachypoda Peters, Reis. Mozamb. Zool., v, p. 527–529, tab. xxxiii, figs. 1–2.

Ochracea vel brunnea, sæpe plus vel minus olivacea, margine postico laminarum dorsalum sæpissime, antennis pedibus posterioribus partim pleurisque sæpe virescentibus; robusta vel minus robusta, sublævis, laminis ventralibus plus vel minus manifesto bisulcatis; capite subovali. Antennæ longiusculæ, ad basin paulum incrassatæ, attenuatæ, 17–22 articulatæ, præter articulos senos vel septenos priores brevissime hirsutæ, articulis mediis longiusculis.

Dentes prosternales quini vel rare quaterni (bini vel terni interiores plus vel minus coaliti), minores, obtusiusculi; dens coxalis in latere nodulo parvo armatus.

Pedum articulus primus tarsalis, pedibus ultimis vel binis posterioribus exceptis, calcare armatus.

Pedes anales breviusculi, plus vel minus incrassati (varissime longiusculi, vix incrassati), articulis binis prioribus deplanatis marginatis, in margine sup. interiore femoris spinulis quaternis vel quinis longis, in series binas digestis, angulo apicali in spinam longiorem, tri- vel quadrifidam producto, in latere inferiore spinulis senis vel novenis majoribus, in series ternas concinne digestis, armati.

Laminæ dorsales posteriores marginatæ.

Pleuræ posticæ latæ, sublæves, dense porosæ, in angulum minorem, tri- vel quadrifidum productæ, margine postico fere in transversum leviter sinuato, spinula perparva armato.

Lamina ultima ventralis breviuscula, latiuscula, lateribus sinuatis, valde angustata, post brevius rotundata.

Long. 90–130 mm.

Perhaps this Scolopendra is the most inconstant species among all the Myriapods, but also very few animals are so common and so widely distributed as Sc. morsitans; yet through all its variations the short, flat, marginated pedes anales with three rows of larger spines on the under side of the femora seldom are missed. On the other hand, if we are not willing to believe in such variability, we are compelled to accept an infinity of species, such as most conspicuously v. Porat has made; but I do not hesitate to say that a larger number of specimens from different parts of the world will bring us to follow the views which Dr. Wood and Dr. Kohlrausch have so forcibly declared with regard to the genus Scolopendra.

Hab. This species is found in all tropical regions, whence it is often brought alive in ships to more northern localities. For this reason it will be of no value to enumerate all those from which specimens have been received by the Museum.

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13. SCOLOPENDRA RUGOSA, n. sp.

Rufo-brunnea, pedibus antennisque flavis; minus robusta, manifesto rugosa; capite subcordiformi. Antennæ longiusculæ, ad basin valde incrassatæ, 18-articulatæ, præter articulos senos vel septenos priores brevissime hirsutæ, articulis breviusculis.

Dentes prosternales seni (bini interiores approximati), parvi; dens coxalis ad apicem carinatus, in latere nodulo instructus.

Pedum articulus primus dorsalis, pedibus binis posterioribus exceptis, calcare armatus.

Pedes anales breviusculi, incrassati, in margine sup. interiore rotundato femoris spinulis ternis magnis, in trigonum digestis, angulo apicali in spinam breviorem, acutam, bifidam producto, in latere inferiore spinis binis magnis seriatis, armati.

Laminæ dorsales præter septem priores marginatæ.

Pleuræ posticæ amplæ, sublæves, densissime porosæ, in angulum minorem, bifidum productæ, margine postico in obliquum leviter arcuato, inermi.

Lamina ultima ventralis longiuscula, latiuscula, valde angustata, post manifesto sinuata.

Long. 120 mm.

Hab. Hong-Kong, Capt. W. H. A. Putnam (one single specimen).

14. SCOLOPENDRA SUBSPINIPES.

Scolopendra subspinipes Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 96.

? Scolopendra subspinipes Leach, Trans. Linn. Soc. Lond., xi, p. 383.

Scolopendra subspinipes, Placeæ, ? Gervaisii, ? Ceylonensis, planiceps, sexspinosa, lutea, ornata, flava Newport, Trans. Linn. Soc. Lond., xix, p. 389–392.

Scolopendra subspinipes, Lucasii, rarispina, Sandwichiana, audax, ? Newportii Gervais, Walckenaer Ins. Apt., iv, p. 262–281.

Scolopendra byssina, dinodon, parvidens, atra, plumbeolata Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 10–14.

Scolopendra byssina Wood, Trans. Amer. Philos. Soc., xiii, p. 164.

Scolopendra pulchra, mactans, ferruginea, sulphurea, gigantea, ornata C. L. Koch, Die Myriap., i, figs. 21, 79, 80, 92; ii, figs. 133, 134.

Scolopendra elongata Porath, Ofvers. Vet. Akad. Förh., 1871, No. 9, p. 1143.

Ochracea vel brunnea, præter caput laminamque primam dorsalem plus vel minus olivacea, margine postico laminarum dorsalium sæpe virescente; robusta vel valde robusta, læviuscula, laminis ventralibus obscurius bisulcatis; capite suborbiculari. Antennæ longiusculæ, ad basin paulum incrassatæ, attenuatæ, 17–20-articulatæ, præter senos priores hirsutæ, articulis plurimis longis.

Dentes prosternales quini vel seni, rarissime quaterni vel septeni, minores, obtusiusculi ; dens coxalis magnus, ad apicem carinatus, in latere nodulo parvo instructus.

Pedum articulus primus tarsalis, pedibus ultimis vel binis posterioribus exceptis, calcare armatus.

Pedes anales longiusculi, sat graciles, in margine sup. interiore rotundato femoris paulum deplanati spinulis sæpissime binis majoribus, angulo apicali plus vel minus producto sæpissime bifido, in latere interiore spinula singula vel nulla, in latere inferiore spinulis binis, in seriem longitudinalem digestis, armati.

Laminæ dorsales præter quatuor vel quinque priores marginatæ.

Pleuræ posticæ minus amplæ, subrugosæ, densissime porosæ, in angulum minorem, bifidum productæ, margine postico leviter arcuato, inermi.

Lamina ultima ventralis longiuscula, angustiuscula, valde angustata, post brevius rotundata.

Long. 150–180 mm.

With regard to frequency, distribution and variability Sc. subspinipes comes near to Sc. morsitans, and therefore I can here refer to my preceding remarks.

Hab. This species also is so common in all tropical and subtropical localities, that I shall not enumerate the many places from which the Museum has specimens.

15. Scolopendra De Haanii.

Scolopendra De Haanii Brandt, Recueil, p. 59.

Kohlrausch, Arch. f. Naturg. Jahrg., 47, p.

Scolopendra Silhetensis, ? inermis, ? concolor, Childreni, Hardwickii Newport, Trans. Linn. Soc. Lond., xix, p. 393–395.

Scolopendra ? limicolor, ? cephalica, ?? gracilis (*var.*) Wood, Proc. Acad. Nat. Sc. Philad., 1861, p. 12–13.

Scolopendra bispinipes Wood, Trans. Amer. Philos. Soc., xiii, p. 166.

Scolopendra bicolor Humbert, Essai Myriap. Ceylan, p. 12.

Scolopendra histrionica, horrida C. L. Koch, Die Myriap., i, figs. 44, 67.

Scolopendra fissispina C. L. Koch, Verh. Zool. bot. Ges. z. Wien, xv, p. 891.

Flavo-brunnea, supra sæpe, præsertim in margine postico laminarum dorsalium, olivacea vel virescens (interdum laminis dorsalibus alternantibus totis olivaceis) ; robusta vel valde robusta, sublævis, laminis ventralibus manifesto bisulcatis ; capite suborbiculari. Antennæ longiusculæ, ad basin valde incrassatæ, attenuatæ, 18-articulatæ, præter articulos senos priores densissime brevissime hirsutæ, articulis plerisque longis.

Dentes prosternales quini, rare quaterni, minores, obtusi ; dens coxalis magnus, obtusiusculus, nodo vel nodis obsoletis instructus.

Pedum articulus primus tarsalis, pedibus binis posterioribus exceptis, calcare armatus.

Pedes anales longiusculi vel longi, sat graciles, in margine sup. interiore femoris paulum vel sat deplanati spinulis binis tenuibus, interdum evanidis, angulo apicali in spinam longam angustatam, sæpissime bifidam producto, armati.

Laminæ dorsales præter sex vel undecim priores marginatæ.

Pleuræ posticæ amplæ, sublæves, densissime tenuius porosæ, in angulum majorem, bifidum productæ, margine postico in obliquum leviter arcuato, inermi.

Lamina ultima ventralis longiuscula, angustiuscula, valde angustata, post rotundate truncata.

Long. 160–170 mm.

Hab. This species also is spread over the whole tropical and subtropical world, and I have seen specimens from: Society Islands, Mr. A. Garrett; Pennaculum, S. India, D. C. Scudder (var.: Sc. histrionica C. L. Koch); Africa, without further narrative of the locality; San Francisco, Cal., T. G. Cary, Jr. (an original specimen of Dr. Wood's Sc. bispinipes).

16. Scolopendra Indica, n. sp.

Olivaceo-flava, ante et post obscurior, supra sæpe viridi-olivacea, capite cum antennis atque fascia media virescentibus, pedibus antennisque flavo-brunneis; minus robusta, sublævis, ante sparse leviter punctata, laminis ventralibus manifesto bisulcatis; capite fere rotundato, post arcuatim sulcato, a lamina prima dorsali partim obtecta vel laminam illam obtegens. Antennæ longiusculæ, ad basin valde incrassatæ, 17–19-articulatæ, præter articulos decem priores dense hirsutæ, articulis plurimis longiusculis.

Dentes prosternales quaterni (exteriores valde discreti), magni, truncati (exteriores acuti); dens coxalis major, acutus.

Pedum articulus primus tarsalis, pedibus binis posterioribus exceptis, calcare armatus.

Pedes anales breviusculi, sat incrassati, deplanati, in latere sup. interiore femoris spinulis ternis parvis, angulo apicali brevi, bi- vel trifido, in latere interiore spinulis ternis vel quinis, in series binas digestis, in latere inf. interiore spinulis binis vel quaternis, in latere inferiore spinulis septenis vel octonis, in series binas digestis, armati.

Laminæ dorsales modo tres vel quatuor posteriores marginatæ.

Pleuræ posticæ angustiusculæ, subrugosæ, dense tenuiter porosæ, in angulum breviorem vel longiorem, acutiusculum, trifidum, in latere spinula singula instructum productæ, margine postico in obliquum levissime sinuato, ad angulum exteriorem spinula parva armato.

Lamina ultima ventralis brevis, latiuscula, lateribus rotundatis, valde angustata, post latissime rotundata vel rotundate truncata.

Long. 60 mm.

In some respects, peculiarly with regard to the structure of the head, Sc. Indica is a connecting link between Scolopendra and the following genus Cormocephalus.

Hab. The Rev. Mr. M. Carleton has collected this Scolopendra at some places in East India; Koolloo, Himalaya; Ambala; a station 70 miles S. W. from Ambala.

9. Gen. **Cormocephalus.**

Cormocephalus Newport, Trans. Linn. Soc. Lond., xix, p. 419.

Lamina cephalica a lamina prima dorsali partim obtecta vel libera (scuta dorsalia metameri tertii manifesta).

Oculi ocellis 4.

Antennæ breviusculæ, ad basin plus vel minus incrassatæ, ante plus vel minus attenuatæ, 17–19-articulatæ, articulis plerisque breviusculis.

Labri fimbria longa, setis longis, densis, simplicibus.

Labii processus subconici, barba e setis brevibus, densis, uncinatis facta; palporum fimbria e setis brevibus, densis, manifesto uncinatis facta.

Palporum maxillarium unguis in latere interiore dentibus binis validis, acutiusculis armatus; fimbria digitalis longior, setis longioribus, densis, parum uncinatis, unguem medium paulum superans.

Mandibulæ ante 12–13 pectinibus juxta et pone lamellam dentatem coarctatis instructæ.

Metameri quarti sternum integrum, robustum; prosternum longe prominens, in dentes majores incisum; pedes prensorii articulo secundo et tertio parvis, interruptis.

Segmentum septimum absque spiraculis.

Spiracula sat profunda, magna, angusta, manifesto triangula, longitudinalia, per paria longitudine decrescentia.

Pleuræ posticæ infra porosæ, in angulum majorem vel minorem productæ.

Pedes anales breviusculi vel longiusculi, paulum incrassati, quinque-articulati, articulo primo (femore) subcarinato, spinigero, ungue sat parvo, parum arcuato unguiculis binis armato vel simplice.

I. Pedum analium unguis unguiculis binis armatus.

1. Cormocephalus afer, n. sp.

Flavo-olivaceus, ante obscurior, linea media dorsali pallida notatus; sat gracilis, ante robustior, sublævis, laminis ventralibus manifesto bisulcatis; capite subovato, truncato. Antennæ breves, ad basin crassæ, attenuatæ, 17-articulatæ, præter articulos octonos priores dense brevissime hirsutæ, articulis brevibus vel breviusculis.

Dentes prosternales quaterni (exteriores discreti), majores; dens coxalis magnus, acutus.

Pedum articulus primus tarsalis, pedibus binis posterioribus exceptis, calcare armatus.

Pedes anales breves vel breviusculi, sat incrassati, in latere sup. interiore femoris spinulis ternis majoribus, angulo in spinam bifidam producto, in latere interiore spinula singula, in latere inf. interiore spinulis ternis, in latere inferiore spinulis senis, in series binas obliquas digestis, armati.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ latæ vel latiusculæ, læviusculæ, dense porosæ, in angulum majorem, acutiusculum, trifidum productæ, margine postico in obliquum levissime emarginato, ad angulum exteriorem spinulis binis parvis armato.

Lamina ultima ventralis breviuscula, latiuscula, lateribus rotundatis, valde angustata, post obscure sinuata.

Long. 45 mm.

Hab. Zanzibar, Cooke.

2. Cormocephalus aurantiipes.

Scolopendra aurantipes Newport, Ann. and Mag. of Nat. Hist., xiii, p. 99.

Cormocephalus aurantiipes Newport, Trans. Linn. Soc. Lond., xix, p. 420.
Kohlrausch, Arch. f. Naturg. Jahrg., 47, p. 87, tab. v, fig. 18.

Cormocephalus brevispinatus L. Koch, Verh. Zool. bot. Ges. z. Wien, xvii, p. 248.

? Cormocephalus obscurus, pallipes Newport, Trans. Linn. Soc. Lond., xix, p. 421–424.

Flavo-olivaceus, fusco trilineatus, pedibus flavis; robustus, sublævis, ante sparse leviter punctatus, laminis ventralibus bisulcatis; capite subobovato, sæpe libero (lamina basali magnam partem detecta). Antennæ breviusculæ, ad basin paulum incrassatæ, attenuatæ, 17-articulatæ, præter articulos quinos vel senos priores dense brevissime hirsutæ, articulis plurimis breviusculis.

Dentes prosternales quaterni (exteriores discreti), magni obtusi; dens coxalis magnus, trilaciniatus vel simplex.

Pedum articulus primus tarsalis omnium inermis.

Pedes anales breviusculi vel breves, incrassati, in latere sup. interiore femoris spinis binis majoribus, angulo in spinam sæpe bifidam producto, in latere interiore spinula singula vel nulla, in latere inf. interiore spinulis binis, in latere inferiore carinula curvata, spinulis binis vel quaternis instructa, armati.

Laminæ dorsales præter sex vel octo priores marginatæ.

Pleuræ posticæ latiusculæ, sublæves, dense porosæ, in spinam breviorem, acutiusculam, in apice bifidam, productæ, margine postico in obliquum sinuato, inermi.

Lamina ultima ventralis breviuscula, latiuscula vel lata, valde angustata, post rotundate truncata.

Long. 85 mm.

Hab. Melbourne, Australia, H. Edwards. Also from America (viz: Guatemala, Ferd. von Müller; Rio de Janeiro, Thayer Exp.), I have seen two specimens, which I cannot separate from this species.

II. Pedum analium unguis inermis.

3. CORMOCEPHALUS AMBIGUUS.

Cormocephalus ambiguus Newport, Trans. Linn. Soc. Lond., xix, p. 423.

? Scolopendra ambigua Brandt, Recueil. p. 63.

Gervais, Walckenaer Ins. Apt., iv, p. 263.

Flavus vel rufo-brunneus, ante et post rufescens; sat robustus, sublævis, ante et post leviter punctatus, laminis ventralibus manifesto bisulcatis; capite subovali, sæpe libero (lamina basali magnam partem detecta). Antennæ longiusculæ, ad basin crassiusculæ, attenuatæ, 17- vel 18-articulatæ, præter articulos quinos priores dense brevissime hirsutæ, articulis plurimis longiusculis.

Dentes prosternales quaterni (exteriores discreti), majores; dens coxalis magnus, bifidus.

Pedum articulus primus tarsalis omnium inermis.

Pedes anales longiusculi, crassiusculi, in latere sup. interiore femoris spinulis binis minoribus, angulo in spinam majorem producto, in latere interiore spinula singula, in latere inf. interiore spinulis binis vel quaternis, in latere inferiore carinula spinulis quinis vel senis instructa, armati.

Laminæ dorsalis præter octo priores marginatæ.

Pleuræ posticæ latæ, sublæves, dense porosæ, in angulum majorem, acutiusculum, bifidum productæ, margine postico in obliquum fere truncato, aculeo singulo, perparvo armato.

Lamina ultima ventralis breviuscula, lata, valde angustata, post sinuate truncata.

Long. 90 mm.

Hab. Port Elizabeth, Cap. bon. sp., Hanson.

10. Gen. **Opisthemega.**

Opisthemega Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 35.

? Theatops Newport, Trans. Linn. Soc. Lond., xix, p. 410.

Lamina cephalica laminam primam dorsalem partim obtegens.

Oculi nulli vel evanidi.

Antennæ breves, ad basin incrassatæ, ante subfiliformes, 17-articulatæ, articulis brevibus vel partim longiusculis.

Labri fimbria in medio interrupta, setis paucioribus, margine manifesto dentato.

Labii processus producti, attenuati, barba brevi e setis paucioribus, simplicibus facta; palporum fimbria e setis longis, densis, uncinatis facta.

Palporum maxillarium unguis duplex (profunde fissus); fimbria digitalis longa, setis longis, densis, uncinatis, unguem manifesto superans.

Mandibulæ ante 12 pectinibus juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum integrum, robustum, medium longe productum; prosternum brevius vel longius prominens, ante in dentes majores vel minores incisum; pedes prensorii articulo primo maximo, secundo et tertio parvis, interruptis, quarto solito multo minore.

Lamina basalis partim detecta.

Segmentum septimum absque spiraculis.

Spiracula sat profunda, magna, producte ovalia, fere perpendicularia, ante et post magis obliqua.

Pleuræ posticæ infra porosæ, magnam partem obtectæ, subtruncatæ.

Pedes anales perbreves, percrassi, contigui (adapti) vel fere contigui, quinquearticulati, articulo primo (femore) inermi, ungue permagno, valido, parum arcuato, inermi.

1. Opisthemega spinicauda.

Opisthemega spinicauda Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 36.

Trans. Amer. Philos. Soc., xiii, p. 170.

? Cryptops posticus Say, Journ. Acad. Nat. Sc. Philad., ii, p. 112.

? Theatops postica Newport, Trans. Linn. Soc. Lond., xix, p. 410.

Ochraceum, ante et post rufescens, minus robustum, sparse punctatum, lamina dorsali prima ante angulatim sulcata, laminis ventralibus fovea media impressis; capite subovali. Antennæ breviusculæ, tenuiusculæ, paulum attenuatæ, 17-articulatæ, ad basin sublæves, ante sparsius longius hirsutæ, articulis mediis longiusculis.

Dentes prosternales bini vel terni, evanescentes; dens coxalis perparvus, obtusus.

Pedum tibia, articulusque primus tarsalis, pedibus binis posterioribus exceptis, calcare armata.

Pedes anales breves, crassati, fere contigui, adapti, margine sup. interiore atque inf. interiore acutis crenulatis, in latere sup. interiore femoris spinulis binis (posteriore majore), in margine inf. interiore spinulis binis vel ternis preparvus armati.

Laminæ dorsalis præter ultimam immarginatæ.

Pleuræ angustæ, subrugosæ, porosæ, truncatæ, inermes.

Lamina ultima ventralis longa, lateribus sinuatis, valde angustata, post levissime sinuata.

Long. 35 mm.

I have seen only one specimen, which was labeled "Opisthemega postica Wood," and is among the large number of Myriapods, which are designated as "types determined and described by Dr. H. Wood in his Myriapods of N. America"; but a little note was attached to this species: "the original catal. says spinicauda," and actually it is to be referred to Opisthemega spinicauda Wood and not to Op. postica Wood.

Hab. Acapulco, Mexico, Mr. A. Agassiz.

2. OPISTHEMEGA CRASSIPES, n. sp.

Rufo-brunneum, subtus pallidius, pedibus antennisque flavis; minus vel sat crassum, sparse leviter punctatum, annulo ultimo pedibusque analibus densius, grossius punctatis lamina dorsali prima ante angulatim sulcata, laminis ventralibus sulco longitudinali atque transversali cruciatim exaratis; capite subovali. Antennæ longiusculæ tenuisculæ, paulum attenuatæ, 17- vel 18-articulatæ, præter latus superius articulorum quaternorum priorum, densius brevius hirsutæ, articulis plurimis longiusculis.

Dentes prosternales bini vel terni, majores; dens coxalis parvus acutiusculus.

Pedum tibia articulisque primus tarsalis, pedibus articis binisque posterioribus exceptis, calcare armati.

Pedes anales perbreves, percrassi, contigui, adapti, deplanati, margine sup. interiore et inf. interiore carinatis, femore inermi.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ angustæ, sublæves, porosæ, post late sinuatæ, inermes.

Lamina ultima ventralis longa, lata, lateribus parum sinuatis, valde angustata, post rotundate truncata.

Long. 36 mm.

Hab. Jacksonville, Fla., J. A. Allen; St. Johns river, Fla.; Pennington's Gap, Lee Co., Va.; Bee Spring, Ky., F. G. Sanborn.

3. OPISTHEMEGA INSULARE, n. sp.

Flavum vel ochraceum, ante et post rufescens; sat gracile, sublæve, lamina ultima dorsali pedibusque analibus sparse leviter punctatis, lamina dorsali prima ante in formam ypsili sulcata, laminis ventralibus sulco longitudinali profundo foveam mediam secante exaratis; capite subovali. Antennæ breviusculæ, paulum crassiusculæ, attenuatæ, 17-articulatæ, ad apicem sparsius, brevissime hirsutæ, articulis mediis longiusculis.

Dentes prosternalis bini vel terni, parvi; dens coxalis perparvus, obtusus.

Pedum tibia articulusque primus tarsalis, tibia pedum primorum pedibusque binis posterioribus exceptis, calcare armata.

Pedes anales breves, crassi, fere contigui, margine sup. interiore et inf. interiore carinatis manifesto serrulatis, in latere sup. interiore femoris post spinula majore armati.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ angustæ, subrugulosæ, porosæ, post late sinuatæ, inermes.

Lamina ultima ventralis longa, lateribus sinuatis, valde angustata, post rotundate truncata.

Long. 35 mm.

Hab. Sandwich Islands, A. Garrett.

11. Gen. **Cryptops.**

Cryptops Leach, Zoöl. Miscell., iii, p. 42.

Lamina cephalica laminam primam dorsalem sæpissime partim obtegens.

Oculi nulli vel evanidi.

Antennæ breviusculæ vel longiusculæ, subfiliformes, 17-articulatæ, articulis plurimis longis vel longiusculis.

Labri fimbria perbrevis, margine in lacinias setiformes, ramosas vel denticulatas inciso.

Labii processus parvi, subconici, barba brevissima, e setis paucis, simplicibus facta; palporum fimbria brevis, e setis simplicibus vel parum uncinatis facta.

Palporum maxillarium unguis integer, inermis, gracilis, fimbria digitalis brevior, setis longis densis, valde uncinatis, unguem explens vel paulum superans.

Mandibulæ ante 7–10 pectinibus juxta et pone lamellam dentatam coarctatis instructæ.

Metameri quarti sternum integrum, subrobustum; prosternum haud prominens (obtectum), inerme; pedes prensorii articulo secundo et tertio parvis, secundo parum interrupto, tertio integro.

Lamina basalis sæpe omnino evanida.

Segmentum septimum absque spiraculis.

Spiracula profunda, parva, producte ovalia, parum obliqua vel fere prona, per paria sensim latitudine parum, longitudine vix decrescentia.

Pleuræ posticæ amplæ, liberæ, porosæ, subtruncatæ.

Pedes anales elongati, crassiusculi, quinquearticulati, aculeati, articulo tertio et quarto infra serratis, cum quinto animali mortuo spastice inflexis, ungue longo, tenuiusculo, paulum arcuato, inermi.

1. Cryptops validus, n. sp.

Ochraceus vel fulvus, pedibus pallidioribus; robustus, ante sublævis vel obscure punctatus, post obscure scabrosus, laminis dorsalibus præter binas priores et posteriores quadrisulcatis, laminis ventralibus præter primam et ultimam in crucem profunde impressis, posterioribus manifestius scabrosis;

capite subquadrato, angulis rotundatis, lateribus arcte marginatis. Antennæ longiusculæ, ad basin paulum incrassatæ, 17-articulatæ, post aculeis brevioribus sparsissime vestitæ, præter articulos quaternos priores manifesto brevissme hirsutæ, articulis plerisque breviusculis.

Dentes prosternales desunt, margine antico aculeis viginti breviusculis instructo; dens coxalis deest.

Pedes aculeis validis, breviusculis densius vestiti.

Pedes anales caduci.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ latæ, rugulosæ, parum hirsutæ, dense tenuiter porosæ, margine postico subrecto, aculeis paucis perbrevibus instructæ.

Lamina ultima ventralis longiuscula, angustiuscula, lateribus rotundatis, multum angustata, post breviter rotundata.

Long. 45 mm.

Hab. Zanzibar, Mr. Cooke.

2. Cryptops Patagonicus, n. sp.

Fulvo-brunneus, pedibus pallidioribus; gracilis, sublævis, laminis dorsalibus præter anticam tresque posteriores sulcis binis arcuatis exaratis, laminis ventralibus præter tres posteriores in crucem manifesto impressis; capite subcordiformi, post truncato, immarginata. Antennæ breviusculæ, ad basin vix incrassatæ, 17-articulatæ, post sparsissime longe aculeatæ, præter articulos ternos priores manifesto longius hirsutæ, articulis breviusculis.

Dentes prosternales desunt, margine antico glabro: dens coxalis deest.

Pedes aculeis longis ante sparse, post sparsissime vestiti.

Pedes anales caduci.

Laminæ dorsales præter ultimam immarginatæ.

Pleuræ posticæ angustiusculæ, semiobtectæ, aculeis paucis vestitæ, poris paucis majoribus perforatæ, margine postico subrecto, aculeis paucis tenuibus instructæ.

Lamina ultima ventralis breviuscula, lata, lateribus rotundatis, multum angustata, post latissime rotundata.

Long. 18 mm.

Hab. Puerto Bueno, Patagonia (one single specimen).

3. Cryptops sulcatus, n. sp.

Fulvo-brunneus, pedibus antennisque pallidioribus; pergracilis, sublævis, laminis dorsalibus præter anticam et ultimam sulcis senis (mediis obsoletioribus, exterioribus arcuatis) in corpore medio profundioribus exaratis, laminis ventralibus præter anticam duasque posteriores in crucem (sulco longitudinali lato, profundo, manifestiore) impressis, capite subovali, post truncato, immarginato. Antennæ breves, ad basin paulum incrassatæ, 17(16)-articulatæ, post densius longius aculeatæ, sparse hirsutæ, ante sparsissime, brevius aculeatæ, densius hirsutæ, articulis brevibus.

Dentes prosternales desunt, margine antico glabro; dens coxalis evanidus.

Pedes aculeis longis ante sparse, post sparsissime vestiti.

Pedes anales caduci.

Laminæ dorsales præter ultimam immarginatæ,

Pleuræ posticæ latiusculæ, subliberæ, subglabræ, poris paucioribus subseriatis majoribus perforatæ, margine postico subrecto, aculeis paucis tenuibus instructæ.

Lamina ultima ventralis, breviuscula lata, lateribus subrectis, valde convergentibus, post latissime sinuata.

Long. 15 mm.

Hab. Bee Spring, Ky., F. G. Sanborn.

2. Fam. GEOPHILINI.

Segmenta pedifera numerosa (31–173 paria), inter se æqualia.

Pedes breves, tarsis integris.

Antennæ 14-articulatæ.

Oculi nulli.

(Pedes prensorii articulo secundo et tertio semper in latere exteriore evanidis vel interruptis.)

Lamina basalis semper manifesta.

Spiraculorum paria numerosa, segmentis numero paulo deteriora.

1. Gen. **Mecistocephalus.**

Mecistocephalus (Newport) Meinert, Myriap. Mus. Haun. i. Geophil., p. 92.

Corpus subdepressum, post plus vel minus angustatum.

Lamina cephalica trophos pro parte minore obtegens, elongata; lamina frontalis discreta; lamina basalis angustata, lateribus ante paulum convergentibus; lamina præbasalis obtecta.

Antennæ sat longæ, vel longæ, filiformes.

Labrum liberum, tripartitum, parte media angustata, margine antico glabro.

Labii sternum bipartitum; processus producti; palpi simplices, producti, integri.

Palporum maxillarium unguis major vel minor.

Mandibulæ ante lamellis pluribus dentatis instructæ.

Metameri quarti sternum subquadratum, ante dentibus duobus parvis armatum; prosternum haud prominens, obtectum; pedes prensorii articulo ultimo (ungue) ad basin dente armato.

Scutella spiraculifera parva, præscutello pluries minora, postscutella magnitudinis fere scutelli, discreto; scutella atque præscutella media et interna evanida.

Laminæ dorsales manifesto bisulcatæ.

Pori ventrales inconspicui.

Pori pleurales numerosi, in ventre et dorso siti.

Pedes anales sexarticulati, inermes ; feminæ tenues vel tenuissimi, maris modice incrassati, articulo primo parvo.

Lamina ultima ventralis triangula, præscutis discretis. Palpi genitales maris sat breves, biarticulati.

1. Mecistocephalus punctifrons.

Mecistocephalus punctifrons Newport, Proc. Zool. Soc. 1843, p. 179, Trans. Linn. Soc. Lond., xix, p. 429, tab. 33, fig. 17.

Meinert, Myriap. Mus. Haun. i. Geophil., p. 97.

Mecistocephalus heteropus Humbert, Essai Myriap. Ceylan, p. 19, tab. ii, fig. 4, 4a–4d.

? Mecistocephalus Guildingii Newport, Trans. Linn. Soc. Lond., xix, p. 429, tab. 33, figs. 18–19.

Meinert, Myriap. Mus. Haun. i. Geophil., p. 96.

Minus robustus, post manifesto attenuatus ; ochraceus vel fulvis, capite cum trophis laminaque prima dorsali dilute castaneis, antennis pedibusque flavis ; sparsissime breviter pilosus, pedibus densius pilosis.

Pedes prensorii breviter vel brevissime, densius pilosi, flexi articulum primum antennarum explentes ; sternum multo latius quam longius (5 : 4), coxa paulo longius, margine antico in medio alte sinuato, dentibus angularibus manifestis, acutis ; coxa dentibus binis magnis armata ; unguis dente majore, setoso armatus.

Lamina cephalica vix duplo longior quam latior (fere 9 : 5), sparsissime foveolata, foveis sex sulcos duos posticos, breves explentibus, marginem anticum laminæ basalis obtegens ; lamina basalis multo latior quam longior (7 : 5).

Antennæ breviusculæ vel longiusculæ, articulis brevibus, primis subnodiformibus, paulum compressis.

Laminæ dorsales sublæves, præter ter vel quatuor priores atque tot posteriores manifesto bisulcatæ (5–20 obsolete foveolatæ), præscutis anterioribus obtectis vel brevissimis, mediis atque posterioribus longis.

Spiracula anteriora magna (antica maxima, subovalia, perpendicularia) subrotunda ; media et posteriora minuta, rotunda.

Laminæ ventrales anteriores præter primam impressione ypsiliformi notatæ, posteriores in medio manifesto sulcatæ, scabrosæ.

Pedes paris primi perminuti ; ceteri sat longi, anteriores manifesto breviores atque crassiores.

Pleuræ posticæ sat vel parum amplæ, densius pilosæ, poris minus numerosis, minutis infra instructæ, margine interiore late, breviter hirsuto ; lamina ultima ventralis triangula, lateribus subrectis, breviter hirsuta.

Pedes anales pedibus paris anterioris valde longiores, paulo tenuiores,

breviter hirsuti, articulis prioribus sparsius (♀) vel densius (♂) breviter hirsutis.

Pedes feminæ pp. 49, maris 49. Long. feminæ 52 mm., maris 50 mm. Lat. feminæ 1.7 mm., maris 1.8 mm.

Hab. **The Rev. Mr. Carleton has presented eight specimens of this species, all from East India; Koolloo, near Himalaya; Ambala; a station 70 miles S. W. from Ambala.**

2. Mecistocephalus heros, n. sp.

Robustus, post valde attenuatus; ochraceus, in dorso atque lateribus dense nigro-marmoratus, capite cum trophis laminaque prima dorsali castaneis, antennis pedibusque flavis; ante subglaber, post in ventre atque lateribus dense et breviter hirsutus, pedibus breviter pilosis.

Pedes prensorii subglabri, flexi articulum primum antennarum fere explentes; sternum vix sesqui latius quam longius (10 : 7), coxa multo longius (fere 5 : 4), margine antico alte sinuato, simplice; coxa dente obtuso armata, supra glabra; unguis dente evanido armatus.

Lamina cephalica vix duplo longior quam latior (9 : 5), sparsissime foveolata, foveis decim vel duodecim in duas series digestis, sulcum posticum, medium, brevem explentibus, marginem anticum laminæ basalis obtegens; lamina basalis bis vel ter latior quam longior (fere 5 : 2).

Antennæ perlongæ, articulis ternis prioribus subclaviformibus, ceteris teretibus, longius vel perlongis.

Laminæ dorsales sublæves, præter quatuor vel quinque priores atque tot posteriores manifesto bisulcatæ, præscutis anterioribus obtectis vel brevissimis, mediis atque posterioribus longis.

Spiracula anteriora magna (antica maxima), subovalia, perpendicularia; media et posteriora minuta, rotunda.

Laminæ ventrales anteriores et mediæ, præter duas anticas, impressione ypsiliformi notatæ; posteriores in medio sulcatæ, sulco post sensim evanescente.

Pedes paris primi brevissimi; ceteri sat longi, anteriores paulo breviores, manifesto crassiores.

Pleuræ posticæ sat amplæ, dense pilosæ, poris majoribus atque minoribus, numerosis, subseriatis infra et supra instructæ; latere interiore breviter hirsuto; lamina ultima ventralis trapezoidea, lateribus subrectis, post breviter hirsuta.

Pedes anales pedibus paris anteriores valde longiores, manifesto tenuiores, pilosi.

Pedes maris pp. 49. Long. maris 83 mm. Lat. maris 4.5 mm.

Hab. **St. Mauritius Island, N. Pike.**

3. Mecistocephalus breviceps, n. sp.

Sat robustus, post modice attenuatus; ochraceus, capite cum trophis

dilute castaneo, antennis fulvis, pedibus flavis; subglaber, pedibus setis sparse vestitis.

Pedes prensorii subglabri, flexi articulum primum antennarum non explentes; sternum sesqui latius quam longius, coxa vix sesqui longius (10 : 7), margine antico in medio alte sinuato, dentibus angularibus manifestis; coxa dente obtuso armata; unguis dente minuto armatus.

Lamina cephalica sesqui longior quam latior, foveolis paucis subseriatis impressa, marginem anticum laminæ basalis obtegens; lamina basalis (magnam partem obtecta) quater latior quam longior.

Antennæ breviusculæ, articulis mediis longioribus.

Laminæ dorsales sublæves, præter primam atque posteriores leviter bisulcatæ, præscutis anterioribus brevissimis, post sensim longioribus, posterioribus longis.

Spiracula anteriora magna (antica maxima), subovalia, perpendicularia; media et posteriora minuta, rotunda.

Laminæ ventrales anteriores præter primam in medio sulco profundo vel post magis obsoleto, marginem attingente, exaratæ, laminæ posteriores sublæves.

Pedes paris primi breves; ceteri sat longi, anteriores paulo breviores atque crassiores.

Pleuræ posticæ sat amplæ, hirsutæ, poris majoribus atque minoribus, numerosis, subseriatis, infra et supra instructæ; margine interiore late hirsuto, lamina ultima ventralis triangula, lateribus subrectis, post breviter hirsuta.

Pedes anales pedibus paris anterioris manifesto longiores, breviter-densius pilosi.

Pedes maris, pp. 45. Long. maris 65 mm. Lat. maris 2.5 mm.

Hab. Nantucket, Mass.

2. Gen. **Geophilus.**

Geophilus (Leach) Meinert, Myriap. Mus. Haun. i. Geophil., p. 58.

Corpus depressum vel subdepressum, ante vix, post modice angustatum.

Lamina cephalica trophos non obtegens; lamina frontalis sæpissime discreta, lamina basalis minus lata vel angusta, lateribus ante convergentibus; lamina præbasalis partim vel omnino obtecta.

Antennæ plus vel minus longæ, filiformes vel subfiliformes.

Labrum liberum, tripartitum, in dentes vel lacinias incisum.

Labii sternum integrum; processus sat parvi; palpi biarticulati, in latere exteriore processibus binis longis instructi.

Palporum maxillarium unguis major vel minor.

Mandibulæ ante lamina singula pectinata instructæ.

Metameri quarti sternum integrum, lineis duabus chitineis abbreviatis vel integris fultum, margine antico inermi vel dentibus duobus parvis in-

structo ; prosternum haud prominens, obtectum ; pedes prensorii articulo ultimo (ungue) dente basali sæpissime armato.

Scutella spiraculifera parva vel minima, præscutello pluries minora, postscutello majore discreto ; scutella atque præscutella media et interna evanida.

Laminæ dorsales manifesto bisulcatæ ; præscuta plurima magna vel longa.

Pori ventrales plus vel minus manifesti.

Pori pleurales multi vel pauciores aut nulli, in ventre solummedo vel etiam in dorso siti.

Pori anales duo aut nulli.

Pedes anales sexarticulati, ungue armati aut inermes ; feminæ graciles, maris graciles vel minus incrassati, articulo primo parvo.

Lamina ultima ventralis angusta aut lata, præscutis a lamina discretis, inter se coalitis aut non coalitis. Palpi genitales maris biarticulati.

A. Lamina frontalis discreta.

(Pori anales nulli).

1. Geophilus cephalicus.

Geophilus cephalicus Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 44.

Trans. Amer. Philos. Soc., xiii, p. 178.

Geophilus lævis Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 44.

Trans. Amer. Philos. Soc., xiii, p. 180.

Sat robustus ante vix, post paulum angustatus ; testaceus, capite cum trophis antennisque dilute brunneo, striga lata, duplice, interrupta, obscura in dorso medio notatus ; sublævis.

Pedes prensorii læves, flexi marginem frontalem spatio majore vel magno superantes ; sternum simplex oblingulatum, multo latius quam longius (fere 4 : 3), coxa duplo longius, margine antico in angulum, in medio sinuatum, producto, inermis ; coxa inermis ; unguis incurvus, dente minuto vel minimo, nodiformi armatus.

Lamina cephalica fere æque longa ac lata, lævis, subovalis, angulos priores laminæ basalis obtegens ; lamina basalis quater latior quam longior, ante alte emarginata, lamina præbasali parvam partem libera.

Antennæ breviusculæ vel longiusculæ, articulis prioribus præter primum longiusculis.

Laminæ dorsales foveis binis longitudinalibus impressæ, manifesto bisulcatæ, præscutis anterioribus brevibus, mediis et posterioribus longis.

Spiracula rotunda, anteriora (præsertim antica) magna ; media et posteriora minuta.

Laminæ ventrales in medio sulcatæ, in angulis fovea porosa vel rotunda (in angulis prioribus) vel transversali (in angulis posterioribus) obsolete exaratæ.

Pedes paris primi ceteris manifesto breviores atque tenuiores, anteriores quam posteriores paulo breviores atque crassiores.

Pleuræ posticæ parum inflatæ, glabræ, foveis binis obliquis, poriferis, semiobtectis instructæ; lamina ultima ventralis perlata, lateribus valde convergentibus, rotundatis.

Pedes anales pedibus paris anterioris paulo longiores, paulo (feminæ) vel valde (maris) crassiores, subglabri (feminæ) vel hirsuti (maris), ungue valido armati.

Pedes feminæ pp. 51–53; maris 49. Long. feminæ 47 mm.; maris 37 mm. Lat. feminæ 2 mm.

Hab. Fred. Co., Md., P. R. Uhler (the type of Dr. Wood); Michigan, E. P. Austin; Charl. Co., Md., Bryant. One specimen was labeled Zanzibar (an recte?).

2. GEOPHILUS MORDAX, n. sp.

Minus robustus, post manifesto angustatus; fulvus, pedibus flavis; subglaber, pedibus pilis brevioribus sparsissime vestitis.

Pedes prensorii subglabri, flexi marginem frontalem vix attingentes; sternum lineis duabus chitineis, integris fultum, sesqui latius quam longius, coxa fere duplo longius (20 : 11), margine antico longe producto, in medio alte sinuatus, inermis; coxa inermis; unguis valde curvatus, dente minimo, obtuso armatus.

Lamina cephalica fere æque longa ac lata, subglabra, subovalis, angulos priores laminæ basalis obtegens; lamina basalis ter latior quam longior, lamina præbasali partem minimam libera.

Antennæ longiusculæ vel longæ, articulis prioribus præter primum longiusculis, articulo ultimo articulos duos antecedentes conjunctos longitudine procul æquante.

Laminæ dorsales sublæves, manifesto bisulcatæ.

Spiracula anteriora ovalia vel subovalia, perpendicularia, magna vel permagna, per paria sensim magnitudine decrescentia; media et posteriora rotunda, minuta.

Lamina ventrales anteriores sulco medio, profundo, abbreviato areaque postica transversali, porosa, mediæ et posteriores sulco minus profundo, integro exaratæ.

Pedes paris primi ceteris paulo breviores atque tenuiores, anteriores quam posteriores paulo breviores atque crassiores.

Pleuræ posticæ vix inflatæ, subglabræ, poris denis vel duodenis magnis, subseriatis instructæ; lamina ultima ventralis minus lata, lateribus subrectis, manifesto convergentibus.

Pedes anales caduci.

Pedes feminæ pp. 51. Long. 25 mm. Lat. 1.2 mm.

Hab. The specimen had no more distinct indication than U. S. A.

B. Lamina frontalis coalita.

a. Pori anales nulli.

3. Geophilus marginalis, n. sp.

Sat robustus, post manifesto angustatus; flavus, capite cum trophis laminaque prima dorsali dilute brunneo, striga lata, duplice, interrupta, obscura in dorso medio notatus, lateribus maculis obscuris, densis irroratis; pilis longioribus densius vestitus.

Pedes prensorii pilis brevibus densius vestiti, flexi articulum primum antennarum spatio majore superantes; sternum simplex, multo latius quam longius (fere 7 : 6), coxa vix sesqui longius, margine antico in medio profunde sinuato, dentibus duobus brevibus armato; coxa dente majore, obtuso armata; unguis parum curvatus, dente magno, acuto armatus.

Lamina cephalica vix sesqui longior quam latior (fere 10 : 7), sat grosse, densius punctata, sulcis duobus longioribus obsolete impressa, lateribus subrectis, post paulum convergentibus, marginem anticum laminæ præbasalis obtegens; lamina basalis ter vel quater latior quam longior (fere 25 : 7).

Antennæ longæ vel perlongæ, articulis prioribus præter primum longis vel perlongis, articulo ultimo duobus antecedentibus conjunctis paulo breviore.

Laminæ dorsales sat grosse punctatæ, foveis binis longis manifesto exaratæ, obscurius bisulcatæ, præscutis anterioribus brevissimis, mediis et posterioribus longiusculis.

Spiracula bina priora ovalia, perpendicularia, magna vel permagna, cetera rotunda, minuta vel perminuta.

Laminæ ventrales profunde sulcatæ, anteriores areis vel foveis quaternis porosis exaratæ.

Pedes paris primi ceteris multo breviores atque tenuiores, anteriores quam posteriores paulo breviores, multo crassiores.

Pleuræ posticæ parum inflatæ, sparse pilosæ, poris numerosis, parvis, seriatis in ventre et dorso instructæ; lamina ultima ventralis angusta, lateribus subrectis, manifesto vel valde angustatis.

Pedes anales (maris) pedibus paris anterioris paulo longiores, valde crassiores, ungue evanido.

Pedes maris pp. 61. Long. 46 mm. Lat. 1.6 mm.

Hab. Key West, Fla. (one single specimen).

4. Geophilus urbicus, n. sp.

Minus robustus, post multum attenuatus; fulvus; pilis brevibus sparsissime vestitus, pedibus pilis longioribus sparse vestitis.

Pedes prensorii subglabri, flexi marginem frontalem procul attingentes; sternum simplex, sesqui latius quam longius, coxa plus sesqui longiores (5 : 3), margine antico in medio late sinuato, dentibus duobus obtusis,

evanidis armato ; coxa dente parvo, acuto armata ; unguis valde curvatus, dente minuto, obtuso armatus.

Lamina cephalica fere æque longa ac lata, subglabra, sulcis duobus transversalibus ante marginem posticum impressa, lateribus rotundatis, manifesto convergentibus, angulos priores laminæ basalis obtegens. margine postico late sinuato ; lamina basalis vix quater latior quam longior, lamina præbasali partim libera.

Antennæ breviusculæ, dense hirsutæ, articulis prioribus præter primum longiusculis, articulo ultimo articulos duos antecedentes conjunctos longitudine manifesto superante.

Laminæ dorsales foveis binis obsoletis exaratæ, obsolete bisulcatæ, præscutis anterioribus et posterioribus brevibus, mediis longis vel perlongis.

Spiracula rotunda, anteriora parva, per paria sensim magnitudine decrescentia, media et posteriora perminuta.

Laminæ ventrales anteriores sulco medio profundo notatæ, mediæ et posteriores sulcis ternis obsoletioribus, post sensim evanescentibus exaratæ.

Pedes paris primi ceteris subæquales, anteriores posterioribus subæquales.

Pleuræ posticæ paulum inflatæ, pilis longioribus sparse vestitæ, poris vicenis magnis vel permagnis (posticis) instructæ ; lamina ultima ventralis angusta, lateribus subrectis, parum convergentibus.

Pedes anales pedibus paris anterioris paulo breviores, multo crassiores, ungue magno armati.

Pedes feminæ pp. 41. Long. 22 mm. Lat. 1.1 mm.

Hab. Cambridge, Mass., E. Schwarz (one single specimen).

5. Geophilus Georgianus, n. sp.

Sat gracilis, post manifesto attenuatus ; ochraceus vel flavus, capite cum trophis dilute brunneo, pedibus testaceis ; subglaber, pedibus pilis longioribus, sparsis vestitis.

Pedes prensorii subglabri, flexi marginem frontalem spatio magno superantes ; sternum simplex, multo latius quam longius (7 : 6), coxa vix duplo longius (20 : 11), margine antico in medio late sinuato, inermi ; coxa dente evanido armata ; unguis curvatus, dente minuto armatus.

Lamina cephalica multo longior quam latior (9 : 7), pilis paucis, brevibus vestita, sulcis duobus longis ante marginem posticum obsolete impressa, subovalis, marginem anticum laminæ basalis obtegens ; laminæ basalis pars libera plus duplo latior quam longior (7 : 3).

Antennæ longæ, in latere exteriore dense pilosæ, articulis prioribus præter primum longis, articulo penultimo articulis duobus antecedentibus conjunctis manifesto breviore.

Laminæ dorsales foveolis binis longitudinalibus obsolete notatæ, manifesto bisulcatæ, præscutis longiusculis vel longis, posterioribus paulo longioribus.

Spiracula rotunda, anteriora magna, per paria sensim magnitudine decrescentia, media et posteriora minuta.

Laminæ ventrales anteriores in medio profunde sulcatæ, pone sulcum area transversali, angusta, porosa notatæ.

Pedes paris primi ceteris multo breviores atque tenuiores, anteriores posterioribus paulo breviores atque crassiores.

Pleuræ posticæ parum inflatæ, poris singulis, validis, obtectis.

Pedes anales pedibus paris anterioris valde longiores, manifesto crassiores, pilis brevibus, sparsis vestiti, ungue evanido armati.

Pedes feminæ pp. 61. Long. 34 mm. Lat. 0.9 mm.

Hab. Georgia (one single specimen).

b. Pori anales parvi.

6. Geophilus occidentalis, n. sp.

Sat gracilis, post manifesto angustatus; ochraceus, capite cum trophis dilute brunneo, antennis flavis; subglaber, pedibus longe, sparse pilosis.

Pedes prensorii subglabri, flexi articulum primum antennarum fere explentes; sternum simplex, æque longum ac latum, coxa sesqui longius, margine antico in medio alte sinuato, angulis integris; coxa dente obtuso armata; unguis dente nodiformi, minore armatus.

Lamina cephalica vix sesqui longior quam latior, post paulum angustata, foveolis minutis, sparsis, subseriatis sulcisque duobus brevibus, obsoletis notata; lamina basalis libera, fere ter latior quam longior.

Antennæ longæ, articulis plurimis longis.

Laminæ dorsales sublæves, manifesto bisulcatæ, præscutis anterioribus perbrevibus, mediis longis, posterioribus longiusculis.

Spiracula præter antica parva, rotunda; antica subovalia.

Laminæ ventrales anteriores profunde sulcatæ, mediæ atque posteriores obsolete impressæ.

Pedes paris primi ceteris manifesto breviores, anteriores quam posteriores paulo crassiores.

Pleuræ posticæ vix inflatæ, poris novenis vel denis liberis, majoribus vel minoribus atque singulo magno, distante instructæ; lamina ultima ventralis angustiuscula, longa, post manifesto angustata.

Pedes anales subglabri, crassiusculi, ungue evanido.

Pedes maris pp. 73. Long. 39 mm. Lat. 1 mm.

Hab. San Francisco, Cal., T. G. Cary, Jr. (one single specimen.)

c. Pori anales magni.

7. Geophilus Huronicus, n. sp.

Sat vel minus robustus, post manifesto angustatus; flavus, capite cum trophis dilute brunneo, pedibus testaceis vel flavis; subglaber, pedibus pilis longioribus sparse vestitis.

Pedes prensorii subglabri, flexi marginem frontalem spatio majore vel minore superantes ; sternum simplex, multo latius quam longius (fere 6 : 5), coxa plus sesqui longius (5 : 3), margine antico altius sinuato, inermi ; coxa dente evanido armata ; unguis dente minuto armatus.

Lamina cephalica paulo longior quam latior (fere 10 : 9), sparse minus grosse punctata, sulcis duobus sat longis obsolete exarata, subovalis, partem majorem laminæ basalis obtegens ; lamina basilis ter latior quam longior.

Antennæ longæ vel perlongæ, articulis præter primum et ultimos longis, articulo ultimo articulis duobus antecedentibus conjunctis manifesto breviore.

Laminæ dorsales fovea media, obsoleta exaratæ, manifesto bisulcatæ, præscutis anteribribus brevissimis vel brevibus, mediis et posterioribus longiusculis vel brevibus.

Spiracula rotunda, anteriora magna per paria sensim magnitudine decrescentia ; media et posteriora minuta.

Laminæ ventrales manifesto sulcatæ, anteriores et mediæ pone medium area magna, transversali, porosa vel integra (in anterioribus) vel bipartita (in mediis) notatæ.

Pedes paris primi ceteris multo breviores atque tenuiores, anteriores posterioribus vix breviores, paulo crassiores.

Pleuræ posticæ vix inflatæ, pilis brevibus sparse vestitæ, poris senis vel octonis majusculis, maximam partem obtectis instructæ ; lamina ultima ventralis lata, lateribus subrectis, paulum convergentibus.

Pedes anales pedibus paris anterioris valde longiores, paulo (feminæ) vel multo (maris) crassiores, ungue majore (feminæ) vel minore (maris) armati.

Pedes feminæ pp. 55–57 ; maris 53–55. Long. feminæ 33 mm.; maris 30 mm. Lat. feminæ 1 mm.; maris 1.2 mm.

Hab. I have seen four specimens of this species; the two were labeled Massachusetts, and the two others "N. Engl."

3. Gen. **Scolioplanes.**

Scolioplanes (B. & M.) Meinert, Myriap. Mus. Haun. i. Geophil., p. 48.

Corpus subdepressum, ante et post attenuatum.

Lamina cephalica trophos non omnino obtegens ; lamina frontalis discreta aut coalita ; lamina basalis transversalis ; lamina præbasalis in duas lamellas partita, obtecta aut detecta.

Antennæ plus vel minus longæ, filiformes, hirsutæ.

Labrum liberum, tripartitum, partis mediæ margine antico in dentes multos inciso.

Labii sternum integrum ; processus sat magni ; palpi integri vel bipartiti, simplices.

Palporum maxillarium unguis parvus.

Mandibulæ ante lamina singula pectinata instructæ.

Metameri quarti sternum integrum, simplex; prosternum haud prominens, obtectum; pedes prensorii articulo ultimo (ungue) dente basali valido armato.

Scutella spiraculifera sat magna, præscutello duplo vel triplo minora, postscutello minore discreto; scutella et præscutella media et interna evanida.

Laminæ dorsales læves; præscuta longiora vel breviora.

Pori ventrales parvi vel minimi, in aream transversalem, posticam dispositi.

Pori pleurales plures vel pauciores.

Pori anales duo, parvi.

Pedes anales sexarticulati; feminæ gracilis, attenuati, maris percrassi vel crassi, hirsuti, articulo primo parvo.

Lamina ultima ventralis longa, lateribus postconvergentibus, præscutis discretis. Palpi genitales maris integri.

I. Lamina frontalis discreta.

1. Scolioplanes bothriopus.

? *Strigamia bothriopus* Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 46.

Trans. Amer. Philos. Soc., xiii, p. 183.

? *Strigamia flava* Sayer, Proc. Acad. Nat. Sc. Philad., viii, p. 109.

Wood, Trans. Amer. Philos. Soc., xiii, p. 183.

Minus robustus, ante et post multum attenuatus; fulvus, capite cum trophis dilute brunneo; pilis brevibus sparse vestitus, pedibus pilis breviusculis densius vestitis.

Pedes prensorii pilis breviusculis sparse vestiti, flexi marginem frontalem spatio magno non attingentes; sternum stricte cordiforme vix duplo latius quam longius (fere 9 : 5), coxa bis vel ter longius (5 : 2), margine antico in medio alte sinuato, inermi; coxa inermis; unguis parum curvatus, dente valido, acuto armatus.

Lamina cephalica paulo latior quam longior (10 : 9), pilis longioribus sparse vestita, læviuscula, lateribus rotundatis, manifesto divergentibus, margine postico a lamina basali obtecta; lamina basalis bis vel ter latior quam longior (fere 5 : 2).

Antennæ longiusculæ, articulis prioribus præter primum longiusculis, articulo ultimo articulos duos antecedentes conjunctos longitudine subæquante.

Laminæ dorsales læviusculæ, præscutis longiusculis vel longis.

Spiracula rotunda, magna vel majuscula, anteriora posterioribus paulo majora.

Laminæ ventrales fovea media, obsoleta areaque magna, duplice, porosa ante marginem posticum notatæ.

Pedes paris primi ceteris manifesto breviores, anteriores et posteriores subæquales.

Pleuræ posticæ parum inflatæ, pilis longioribus sparse vestitæ, poris tredenis vel sedenis (præter unum distantem in series rotundatas digestis) parvis et majusculis instructæ; lamina ultima ventralis angusta, lateribus curvatis, convergentibus.

Pedes anales pedibus paris anterioris paulo breviores, vix (feminæ) vel valde (maris) crassiores, ungue parvo armati.

Pedes feminæ pp. 51; maris 47–51. Long. feminæ 24 mm.; maris 35 mm. Lat. maris 1.3 mm.

The specimen of the Museum of Comp. Zoöl. was labeled "Strigamia fulva Say," determined by Dr. Wood.

Hab. Massachusetts.

2. SCOLIOPLANES CHIONOPHILUS.

? *Strigamia chionophila* Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 50.

Trans. Amer. Philos. Soc., xiii, p. 189.

Minus robustus, ante et post multum attenuatus; fulvus, capite cum trophis dilute brunneo; pilis brevibus sparse vestitus, pedibus pilis longioribus sparse vestitis.

Pedes prensorii subglabri, flexi marginem frontalem non attingentes; sternum subcordiforme, paulo latius quam longius (10 : 9), coxa bis vel ter longius (5 : 2), margine antico in medio late sinuato, inermi; coxa inermis; unguis valde curvatus, dente valido, acutiusculo armatus.

Lamina cephalica multo latior quam longior (5 : 4), subglabra, læviuscula, lateribus paulum rotundatis, manifesto divergentibus, margine postico subrecto, laminam basalem plus vel minus obtegente; lamina basalis plus ter latior quam longior (fere 10 : 3).

Antennæ breviusculæ, articulis præter primum el ultimum breviusculis, articulo ultimo articulos duos antecedentes conjunctos longitudine subæquante.

Laminæ dorsales læviusculæ, præscutis anterioribus brevibus vel brevissimis, mediis et posterioribus longis vel perlongis.

Spiracula rotunda, anteriora parva, media et posteriora minuta.

Laminæ ventrales foveis ternis in seriem mediam transversalem digestis plus vel minus manifesto exaratæ.

Pedes parium trium priorum per paria sensim longitudine manifesto crescentes, ceterorum anteriores posterioribus subæquales.

Pleuræ posticæ coxiformes, subglabræ, poris novenis vel tredenis in obliquum subseriatis, magnis et permagnis instructæ; lamina ultima ventralis triangula.

Pedes anales pedibus paris anterioris subæquales, ungue minore (feminæ) vel paulo crassiores, ungue longo (maris).

Pedes feminæ pp. 39; maris 41. Long. feminæ 22 mm.; maris 25 mm. Lat. maris 1.3 mm.

Hab. Cambridge, Mass., Mr. E. Schwarz.

3. Scolioplanes robustus, n. sp.

Sat robustus, ante et post vix angustatus; fulvus, capite cum trophis laminaque basali et prima dorsali dilute brunneo; subglaber, pedibus pilis brevibus sparsissime vestitis.

Pedes prensorii subglabri, flexi marginem frontalem spatio magno non attingentes; sternum subcordiforme, plus sesqui latius quam longius (5 : 3), coxa plus duplo longius (9 : 4), margine antico in medio alte sinuato, inermi; coxa inermis; unguis parum curvatus, dente valido, acuto armatus.

Lamina cephalica paulo latior quam longior (10 : 9), subglabra, læviuscula, lateribus rotundatis, manifesto divergentibus, margine postico a lamina basali vix obtecto; lamina basalis quam lamina cephalica duplo brevior, bis vel ter latior quam longior (5 : 2).

Antennæ longæ, articulis prioribus præter primum longis, articulo ultimo articulis duobus antecedentibus conjunctis manifesto breviore.

Laminæ dorsales lævissculæ, præscutis breviusculis.

Spiracula rotunda, sat magna.

Laminæ ventrales fovea media oblonga, post sensim obsoletiore, areisque duabus duplicibus, porosis ante marginem posticum exaratæ.

Pedes paris primi ceteris manifesto breviores, anteriores quam posteriores paulo breviores et crassiores.

Pleuræ posticæ modice inflatæ, glabræ, poris vicenis magnis et permagnis, subseriatis instructæ; lamina ultima ventralis angusta, triangula, parva.

Pedes anales pedibus paris anterioris paulo breviores atque tenuiores, ungue majusculo armati.

Pedes feminæ pp. 53. Long. 40 mm. Lat. 2.1 mm.

Hab. This species had no more distinct locality than N. A.?

4. Scolioplanes exul, n. sp.

Robustus, ante valde post parum angustatus, fulvus; pedibus flavis; pilis brevissimis sparse vestitus, pedibus pilis brevioribus sparse vestitis.

Pedes prensorii pilis brevissimis et brevibus densius vestiti; flexi marginem frontalem fere attingentes; sternum subcordiforme, plus sesqui latius quam longius (5 : 3), margine antico in medio alte sinuato, inermi; coxa inermis; unguis curvatus, dente valido, acutiusculo armatus.

Lamina cephalica æque longa ac lata, pilis brevibus sparse vestita, lævissicula, subovalis, margine postico subrecto, laminam præbasalem fere totam obtegente; lamina basalis quam lamina cephalica vix ter brevior, plus ter latior quam longior.

Antennæ longæ, subfiliformes, articulis prioribus præter primum longis, articulo ultimo articulis duobus antecedentibus conjunctis manifesto breviore.

Laminæ dorsales lævisculæ, præscutis breviusculis.

Spiracula rotunda magna vel permagna, anteriora per paria sensim magnitudine decrescentia.

Laminæ ventrales anteriores in medio profunde sulcatæ, foveis binis obsoletioribus, lateralibus areisque binis magnis, porosis ante marginem posticum exaratæ, mediæ et posteriores in medio obsoletius (ante) vel manifestius (post) sulcatæ, ante marginem posticum area permagna, transversali, porosa notatæ.

Pedes paris primi ceteris manifesto breviores et tenuiores, anteriores et posteriores subæquales.

Pleuræ posticæ coxiformes, sat inflatæ, pilis brevioribus densius vestitæ, poris denis magnis, partim obtectis instructæ; lamina ultima ventralis brevis, transversalis, lateribus subrectis, valde convergentibus.

Pedes anales pedibus paris anterioris manifesto longiores, valde incrassati, compressiusculi, articulo ultimo quam penultimo multoties minore, conico, ungue evanido armato.

Pedes maris pp. 65. Long. 45 mm. Lat. 2.2 mm.

Hab. This new species was labeled "No Loc."

II. Lamina frontalis coalita.

5. Scolioplanes parviceps.

? Strigamia parviceps Wood, Trans. Amer. Philos. Soc., xiii, p. 187.

Minus robustus, ante multum post manifesto angustatus; flavus, concolor, vel ante et post fulvus; glaber.

Pedes prensorii glabri, flexi marginem frontalem procul attingentes; sternum vix duplo latius quam longius (fere 9 : 5), coxa duplo longius, margine antico in medio rectangulatim inciso, inermi; coxa inermis; unguis parum curvatus, dente valido, acuto armatus.

Lamina cephalica fere æque longa ac lata, glabra, lævis, lateribus rotundatis, manifesto divergentibus, margine postico rotundato, laminam præbasalem maximam partem obtegente; lamina basalis quam lamina cephalica duplo brevior, bis vel ter latior quam longior (fere 5 : 2), lamina præbasali in lateribus paulum libera.

Antennæ longiusculæ, articulis prioribus præter primum longis, articulo ultimo articulis duobus antecedentibus conjunctis multo breviore.

Laminæ dorsales lævisculæ, præscutis anterioribus breviusculis vel brevibus, mediis et posterioribus longiusculis.

Spiracula rotunda, anteriora permagna vel magna, per paria sensim magnitudine decrescentia; media et posteriora mediocria.

Laminæ ventralis præter primam et ultimam foveis septenis porosis,

quarum singula rotunda in medium senæque in binas series laterales digestæ, exaratæ.

Pedes paris primi ceteris manifesto breviores et tenuiores; priores per paria sensim longitudine crescentes.

Pleuræ posticæ manifesto inflatæ, glabræ, poris fere tricenis parvis et magnis, subseriatis instructæ; lamina ultima ventralis angusta, lateribus subrectis, multum convergentibus.

Pedes anales pedibus paris anterioris manifesto longiores, paulo tenuiores, ungue parvo armati.

Pedes feminæ pp. 75. Long. 47 mm. Lat. 1.7 mm.

A specimen, which was said to be a type of Dr. Wood, was labeled "Strigamia bidens Wood."

Hab. The locality was not more distinct than "N. A. Loc.?"

6. Scolioplanes ? longicornis, n. sp.

Sat gracilis, ante valde post manifesto angustatus; fulvus, antennis pedibusque flavis; subglaber, pedibus pilis longioribus sparse vestitis.

Pedes prensorii subglabri, flexi marginem frontalem fere attingentes; sternum subcordiforme, sesqui latius quam longius, coxa fere duplo longius, margine antico in medio alte sinuato; coxa inermis; unguis longus, tenuis, curvatus, dente sat magno armatus.

Lamina cephalica multo longior quam latior (11 : 8), glabra, lævis, lateribus rotundatis, manifesto convergentibus, margine postico marginem anticum laminæ præbasalis obtegente; lamina basalis quam lamina cephalica bis vel ter brevior (2 : 5), plus duplo latior quam longior (9 : 4), lamina præbasali magnam partem libera.

Antennæ ad basin fere contiguæ, longæ vel perlongæ, filiformes, articulis prioribus præter primum perlongis, articulo ultimo articulos duos antecedentes conjunctos longitudine subæquante.

Laminæ dorsales læviusculæ, præscutis anterioribus breviusculis, mediis et posterioribus longiusculis.

Spiracula rotunda, magna vel mediocria, anteriora paulo majora, per paria sensim magnitudine decrescentia.

Laminæ ventrales sulcatæ, foveis binis exaratæ, sulcis foveisque post sensim obsoletioribus.

Pedes paris primi ceteris vix breviores et tenuiores, anteriores posterioribus paulo crassiores, vix breviores.

Pleuræ posticæ parum inflatæ, subglabræ, poris vicenis magnis, biseriatis instructæ; lamina ultima ventralis minus lata, lateribus subrectis, manifesto convergentibus.

Pedes anales pedibus paris anterioris multo longiores, vix crassiores, ungue magno armati.

Pedes feminæ pp. 107. Long. 65 mm. Lat. 1.2 mm.

Perhaps, or rather probably, this species ought to constitute a

new genus, but solely I have had for investigation one single specimen, and therefore I have not been able to put the animal and particularly the parts of the mouth to the necessary microscopical examination.

Hab. Also the species was labeled "No locality."

4. Gen. **Himantarium.**

Himantarium (Koch) Meinert, Myriap. Mus. Haun. i. Geophil., p. 21.

Corpus depressum vel subdepressum, lineare vel ante et post levissime angustatum.

Lamina cephalica trophos obtegens; lamina cephalica discreta aut coalita; lamina basalis latissima, transversalis, lateribus post convergentibus vel subparallelis, lamina præbasalis evanida.

Antennæ curtæ, crassæ, attenuatæ.

Labrum liberum, integrum, dentatum.

Labii sternum integrum; processus parvi; palpi integri vel biarticulati, extrorsum dente magno armati.

Palporum maxillarium unguis minor.

Mandibulæ ante laminis pectinatis pluribus atque lamella dentata instructæ.

Metameri quarti sternum integrum, lineis chitineis duabus fultum; prosternum haud prominens, obtectum; pedes prensorii ungue inermi.

Scutella spiraculifera parva, præscutello duplo vel pluries minora, posscutello parvo discreto; scutella atque præscutella media et interna manifesta.

Laminæ dorsales obsolete bisulcatæ, subglabræ vel scabrosæ; præscuta breviuscula vel longiuscula.

Pori ventrales in omnibus fere vel in pluribus laminis in aream definitam coarctati.

Pori pleurales sæpissime permulti, interdum pauciores, obtecti vel nulli; pleuræ inflatæ, interdum coxiformes.

Pori anales nulli.

Pedes anales inermes, sexarticulati; feminæ graciles, subfiliformes, subnudi, maris paulo crassiores, breviter hirsuti.

Lamina ultima ventralis plus vel minus triangula, præscutis evanidis vel discretis. Palpi genitales maris manifesto biarticulati.

Lamina ultima dorsalis lævis, simplex.

Lamina frontalis coalita.

1. Himantarium insigne, n. sp.

Robustum, ante et post manifesto angustatum; olivaceum vel luridum; glabrum.

Pedes prensorii glabri, flexi marginem frontalem procul attingentes;

sternum plus duplo latius quam longius (7 : 3), coxa sesqui longius, margine antico in medio late sinuato, inermi; coxa inermis; unguis valde curvatus, inermis.

Lamina cephalica subsemicircularis, vix sesqui latior quam longior (10 : 7), glabra, læviuscula, margine postico latissime rotundato, marginem anticum medium laminæ basalis obtegente; lamina basalis quam lamina cephalica plus quater brevior, quater vel quinquies latior quam longior (fere 9 : 2).

Antennæ breves, ad basin contiguæ, incrassatæ, manifesto attenuatæ, articulis præter ultimum transversalibus, articulo ultimo articulis duobus antecedentibus conjunctis multo longiore (4 : 3).

Laminæ dorsales lævisculæ, foveis binis lateralibus, obsoletis exaratæ, præscutis longiusculis.

Spiracula subovalia, paulum obliqua, mediocria, anteriora posterioribus paulo majora.

Laminæ ventrales præter primam et ultimam pone medium area transversali, porosa instructæ.

Pedes paris primi ceteris paulo breviores atque tenuiores, anteriores et posteriores subæquales.

Pleuræ posticæ coxiformes, non inflatæ, integræ; lamina ultima ventralis parva, transversalis, lateribus subrectis, paulum convergentibus, margine postico angulatim sinuato.

Pedes anales pedibus paris anterioris paulo breviores, manifesto tenuiores, inermes.

Pedes feminæ pp. 77. Long. 105 mm. Lat. 4 mm.

Hab. Koolloo, Rev. Mr. Carleton.

2. Himantarium Indicum, n. sp.

Sat robustum, ante multum, post paulum angustatum; fulvum vel flavum, glabrum, pedibus pilis brevibus sparsissime vestitis.

Pedes prensorii glabri, flexi marginem frontalem spatio magno non attingentes; sternum duplo latius quam longius, coxa duplo longius, margine antico in medio late sinuato, inermi; coxa inermis; unguis valde curvatus, inermis.

Lamina cephalica æque longa ac lata, glabra, læviuscula, lateribus rotundatis, manifesto divergentibus, margine postico vix rotundato marginem anticum laminæ basalis obtegente; lamina basalis quam lamina cephalica plus quater brevior, quater vel quinquies latior quam longior.

Antennæ breves vel perbreves, ad basin distantes, crassæ attenuatæ, articulis præter ultimum transversalibus, articulo ultimo articulis duobus antecedentibus conjunctis manifesto longiore.

Laminæ dorsales lævisculæ vel obsolete rugulosæ, præscutis anterioribus brevibus vel breviusculis, mediis et posterioribus longis vel longiusculis.

Spiracula rotunda anteriora magna, per paria sensim magnitudine paulum decrescentia, media et posteriora parva.

Laminæ ventrales præter primam et ultimam impressione lineari, transversali, porosa notatæ.

Pedes paris primi ceteris paulo breviores atque tenuiores, anteriores posterioribus paulo crassiores.

Pleuræ posticæ coxiformes, pilis brevissimis sparse vestitæ, integræ; lamina ultima ventralis sat parva, lateribus rectis, parum convergentibus.

Pedes anales pedibus paris anterioris multo longiores, aut vix (feminæ) aut valde (maris) crassiores, articulo ultimo quam penultimo paulo longiore, inermes.

Pedes feminæ pp. 67; maris 67. Long. feminæ 45 mm.; maris 53 mm. Lat. maris 2.2 mm.

Hab. Koolloo, Rev. Mr. Carleton.

3. Himantarium tæniopse.

Strigamia tæniopsis Wood, Journ. Acad. Nat. Soc. Philad., new ser., v, p. 48.
Trans. Amer. Philos. Soc. xiii, p. 185.

Minus gracile, ante et post paulum angustatum; fulvum vel flavum; glabrum.

Pedes prensorii glabri, flexi marginem frontalem fere attingentes; sternum fere duplo latius quam longius, coxa fere sesqui longius, margine antico in medio late sinuato, inermi; coxa inermis; unguis curvatus, inermis.

Lamina cephalica multo latior quam longior (fere 4 : 3), glabra, læviuscula, margine postico subrecto, marginem anticum laminæ basalis obtegente; lamina basalis quam lamina cephalica plus ter brevior (fere 3 : 10), quater latior quam longior.

Antennæ longiusculæ, ad basin distantes, paulum incrassatæ, manifesto attenuatæ, articulis prioribus præter primum longiuscul.s, articulo ultimo articulis duobus antecedentibus conjunctis manifesto breviore.

Laminæ dorsales læviusculæ, præscutis anterioribus breviusculis, mediis et posterioribus longiusculis.

Spiracula subovalia, perpendicularia, anteriora magna, per paria sensim magnitudine paulum decrescentia, media et posteriora minuta.

Laminæ ventrales anteriores area majore, subovali, transversali, porosa, mediæ et posteriores area minore vel parva, rotundata, porosa pone medium exaratæ.

Pedes paris primi ceteris paulo vel vix breviores, anteriores posterioribus manifesto crassiores, paulo breviores.

Pleuræ posticæ parum inflatæ, glabræ, integræ; lamina ultima ventralis mediocris, lateribus rotundatis, multum convergentibus.

Pedes anales pedibus paris anterioris vix longiores, manifesto tenuiores, inermes.

Pedes feminæ pp. 143. Long. 130 mm. Lat. 2.4 mm.

Hab. San Diego, Cal.

4. Himantarium laticeps.

Strigama laticeps Wood, Journ. Acad. Nat. Sc. Philad., new ser., v, p. 49.
Trans. Amer. Philos. Soc. xiii, p. 186.

Gracile, ante et post leviter angustatum, ochraceum, glabrum.

Pedes prensorii glabri, flexi marginem frontalem fere attingentes; sternum oblingulatum, plus duplo latius quam longius (9 : 4), coxa vix duplo longius (fere 9 : 5), margine antico in medio sat alte sinuato, inermi; coxa inermis; unguis parum curvatus, inermis.

Lamina cephalica multo latior quam longior (4 : 3), glabra, lævis, subpentagona, partem anteriorem mediam laminæ basalis obtegens; lamina basalis, quoad liberam, quam lamina cephalica quater brevior, quinquies latior quam longior.

Laminæ dorsales obsolete bisulcatæ, area media paulum depressa, præscutis breviusculis vel longiusculis.

Spiracula rotunda, anteriora magna; media et posteriora parva.

Laminæ ventrales præter primam et ultimam area angusta, transversali, porosa in medio vel post sensim marginem posticum proprius exaratæ.

Pedes paris primi ceteris manifesto breviores, anteriores posterioribus manifesto crassiores.

Pleuræ posticæ parum inflatæ, glabræ, foveis ternis magnis, semiobtectis, porosis instructæ; lamina ultima ventralis sat lata, post angulatim sinuata, profunde sulcata, lateribus rectis, valde convergentibus.

Pedes anales pedibus paris anterioris paulo breviores, valde crassiores, inermes.

Pedes maris pp. 81. Long. 76 mm. Lat. 1.4 mm.

Hab. Texas, Chas. Stolley (the type of Mr. Wood).

5. Gen. **Orphnæus.**

Orphnæus Meinert, Myriap. Mus. Haun. i. Geophil., p. 17.

Corpus subdepressum, ante et post minus angustatum.

Lamina cephalica trophos plus vel minus obtegens; lamina frontalis coalita; lamina basalis latior, lateribus post paulum divergentibus; lamina præbasalis evanida.

Antennæ subteretes, curtæ, paulum attenuatæ.

Labrum liberum, integrum, dense dentatum.

Labii sternum integrum; processus breves; palpi integri, extrorsum processis binis membranaceis instructæ.

Palporum maxillarium unguis sat magnus.

Mandibulæ ante laminis pectinatis quaternis vel quinis instructæ.

Metameri quarti sternum integrum, transversale, simplex; prosternum haud prominens, obtectum; pedes prensorii ungue inermi.

Scutella spiraculifera magna, fere magnitudinis præscutelli, postscutello majore discreto; scutella atque præscutella interna evanida.

Laminæ dorsales leviter vel levissime scabrosæ, bifoveolatæ ; præscuta majora.

Pori ventrales in plagas quaternas digesti.

Pori pleurales nulli.

Pori anales nulli.

Pedes anales inermes, pseudo-septemarticulati, pleuris coxas simulantibus, hirsuti ; feminæ sat graciles, attenuati, maris aliquanto crassiores.

Lamina ultima ventralis lata, obtusa, præscutis discretis. Palpi genitales maris manifesto biarticulati.

1. Orphnæus lividus.

Orphnæus lividus Meinert, Myriap. Mus. Haun. i. Geophil., p. 19.

Minus robustus, ante et post paulum angustatus ; ochraceus vel lividus, vitta media, duplice, latiore, fusca in dorso plus vel minus manifesto notatus.

Pedes prensorii glabri, flexi marginem frontalem spatio magno non attingentes ; sternum plus duplo latius quam longius (fere 11 : 5), coxa plus duplo longius (7 : 3), margine antico in medio late sinuato, inermi ; coxa inermis ; unguis curvatus, inermis.

Lamina cephalica multo latior quam longior (fere 5 : 4), glabra, lævius-cula, lateribus rotundatis, manifesto divergentibus, margine postico subrecto, marginem anticum laminæ basalis obtegente ; lamina basalis quam lamina cephalica plus duplo brevior (fere 3 : 7), vix ter latior quam longior (fere 11 : 4).

Antennæ breves vel perbreves, ad basin distantes, crassæ, attenuatæ, articulis præter ultimum transversalibus, articulo ultimo articulis duobus antecedentibus conjunctis paulo breviore.

Laminæ dorsales leviter scabrosæ foveis ternis, media multo majore et obsoletiore, plus vel minus manifesto exaratæ, præscutis brevibus.

Spiracula ovalia, obliqua, anteriora magna, per paria sensim magnitudine paulum decrescentia ; media et posteriora parva vel minuta.

Laminæ ventrales præter primam et sæpe ultimam fovea media vel foveis ternis in seriem transversalem digestis notatæ, poris in plagas quaternas magnas dispositis.

Pedes paris primi ceteris vix breviores atque tenuiores, anteriores et posteriores subæquales.

Pleuræ posticæ vix inflatæ, glabræ, integræ ; lamina ultima ventralis parva, transversalis, lateribus rectis, valde convergentibus.

Pedes anales pedibus paris anterioris paulo breviores, vix (feminæ) aut aliquanto (maris) crassiores, inermes.

Pedes feminæ pp. 71–79 ; maris 71. Long. feminæ 85 mm. ; maris 50 mm. Lat. feminæ 2.75 mm.

Hab. Sandwich islands, Society islands, J. M. Barnard ; Ascension islands, South sea ; Zanzibar, Mr. Cooke.

2. Orphnæus Brasiliensis.

Orphnæus Brasiliensis Meinert, Myriap. Mus. Haun. i. Geophil., p 20.

Minus vel sat robustus, ante multum post paulum angustatus, ochraceus vel pallide lividus, capite cum trophis laminaque basali dorsalique ultima fulvo vel brunneo, antennis fulvis, maculis fuscis, in series plures digestis, notatus; subglaber.

Pedes prensorii glabri, flexi marginem frontalem magno spatio non attingentes; sternum ter latius quam longius, coxa sesqui longius, margine antico in medio leviter sinuato, inermi; coxa inermis; unguis curvatus, inermis.

Lamina cephalica manifesto latior quam longior, glabra, læviuscula, lateribus rotundatis, paulum divergentibus, margine postico subrecto, marginem anticum laminæ basalis obtegente; lamina basalis quam lamina cephalica plus duplo brevior (9 : 20), ter latior quam longior.

Antennæ breves, ad basin distantes, crassæ, attenuatæ, articulis præter ultimum transversalibus, articulo ultimo articulis duobus antecedentibus conjunctis paulo longiore.

Laminæ dorsales bi- vel trisulcatæ, sulco medio latiore, obsoletiore, foveis binis lateralibus notatæ.

Spiracula ovalia, anteriora obliqua, magna, per paria sensim magnitudine decrescentia; media et posteriora prona, parva.

Laminæ ventrales fovea vel area media, post sensim paulo majore atque obsoletiore impressæ, lateribus porosis.

Pedes paris primi ceteris manifesto breviores, anteriores posterioribus manifesto crassiores, vix breviores, medii paulo longiores.

Pleuræ posticæ vix inflatæ, glabræ, integræ; lamina ultima ventralis sat parva, lateribus subrectis, valde convergentibus.

Pedes anales pedibus paris anterioris paulo breviores, vix (feminæ) aut aliquanto (maris) crassiores, inermes.

Pedes feminæ pp. 75–85; maris 67. Long. feminæ 86 mm.; maris 47 mm. Lat. feminæ 2.1 mm.

Hab. Rio de Janeiro, Thayer Exped.; Panama; Poloon, Occidental Dept., Nicaragua, Mr. McNiel.

6. Gen. **Notiphilides.**

Notiphilides Latzel, Myriap. oesterr. ung. Mon., p. 20.

Corpus depressum, ante et post angustatum.

Lamina cephalica trophos non obtegens; lamina frontalis coalita; lamina basalis lata, lateribus post paulum divergentibus; lamina præbasalis evanida.

Antennæ subdepressæ, curtæ, parum attenuatæ.

Labrum coalitum integrum, margine antico interne dense, externe sparsim dentato.

Labii sternum integrum; processus breves, perlati, subconici; palpi lati, integri, extrorsum processibus binis longis instructi.

Palporum maxillarium unguis in marginibus interioribus in dentes plures incisus.

Mandibulæ ante laminis pectinatis quaternis instructæ.

Metameri quarti sternum integrum, transversale, simplex; prosternum haud prominens, obtectum; pedes prensorii coxa inermi.

Scutella spiraculifera magna, præscutello paulo minora, postscutello majore discreto; scutella et præscutella interna manifesta.

Laminæ dorsales bisulcatæ; præscuta brevia.

Pori ventrales minimi, in marginem anticum et posticum digesti, inconspicui.

Pori pleuralis nulli.

Pori anales nulli.

Pedes anales inermes, pseudo-sexarticulati, pleuris coxas simulantibus, feminæ subgraciles, parum attenuati, subnudi, maris parum incrassati atque attenuati, subnudi.

Lamina ultima ventralis transversali, præscutis nulles discretis. Palpi genitales maris manifesto biarticulati.

1. Notiphilides Maximiliani.

Notiphilus Maximiliani Humbert et Saussure, Rev. et Mag. Zool., 2 sér., xxii, p. 205.

Saussure et Humbert, Etud. s. Myriap., p. 141, tab. vi, figs. 22, 22d, 22v.

Robustus, ante et post manifesto angustatus; brunneo-olivaceus, glaber.

Pedes prensorii glabri, flexi marginem frontalem procul attingentes; sternum ter latius quam longius, coxa duplo longius, margine antico in medio late sinuato, inermi; coxa inermis; unguis inermis.

Lamina cephalica multo latior quam longior, lævis, subovalis, margine postico a lamina basali obtecto; lamina basalis quater latior quam longior.

Antennæ breviusculæ vel breves, attenuatæ, articulis præter ultimum transversalibus, articulo ultimo articulos duos antecedentes conjunctos longitudine subæquante.

Laminæ dorsales manifesto scrobiculatæ, præscutis brevissimis.

Spiracula subovalia, obliqua, anteriora majora, per paria sensim magnitudine decrescentia; media et posteriora minora.

Laminæ ventrales præter sulcos binos lateralibus maximam partem porosæ, impressione media, angusta, simplice notatæ.

Pedes paris primi ceteris multo breviores, paulo tenuiores, anteriores posterioribus subæquales.

Pleuræ posticæ coxiformes, integræ; lamina ultima ventralis parva, transversalis, lateribus subrectis, multum convergentibus.

Pedes anales pedibus paris anterioris manifesto breviores, multo crassiores, inermes.

Pedes feminæ pp. 97; maris 85. Long. feminæ 90 mm.; maris 55. Lat feminæ 3.7 mm.

Hab. Guatemala, v. Patten.

On the Structure of the Brain and Auditory Apparatus of a Theromorphous Reptile of the Permian Epoch. By E. D. Cope.

(*Read before the American Philosophical Society, October 16, 1885.*)

The following observations are made on a part of a skull of one of the Diadectidæ (Pelycosauria with transverse molar teeth*), which is accompanied by several vertebræ and other fragments of the skeleton, of a single individual of undetermined species. A few characters are derived from skulls of two allied species, *Diadectes phaseolinus* and *Empedias molaris* Cope, which, like the first named specimen, were derived from the Permian formation of Texas. A cast of the brain chamber was obtained, thanks to the skill of my assistant, Mr. Geismar, first in the elastic material patented by Bendernagel & Co., of Philadelphia, for the manufacture of printers inking rolls; and afterwards in plaster of Paris, in a mould made from the elastic cast.

The brain-case in the Diadectidæ differs from that of the Clepsydropidæ much as that of the Varamidæ differ from those of other Lacertilia. That is, it is continued between the orbits, so as to enclose the olfactory lobes of the brain within osseous walls. These walls are thin; especially at the interorbital region, and in the specimen the anterior extremity is so far imperfect as to leave the form of the anterior fundus in doubt.

The brain in reptiles, as is well known, does not fill tightly the cranial chamber as is the case with the Mammalia, there being a wadding of connective tissue, with interspaces filled with lymph and fat, between it and the cranial walls. In the present species the postfrontal part of the cranium is so contracted that there could have been but little space of this kind, and the superior walls are clearly impressed by the surfaces of the middle brain and the cerebellum. The form of the inferior surface of the brain posterior to the fifth pair of nerves cannot be determined from the specimen examined, owing to the absence of the basioccipital and basisphenoid bones.

The conformation of the cranial walls requires preliminary notice. In the first place the vestibule of the ear can only have been separated from the brain by a membranous septum, as is the case in the *Protonopsis horrida*† (Menopoma). In clearing out the matrix no trace of osseous lamina could be detected on either side, and the edges of the huge foramen thus produced are entire, and present no broken edges. Anterior to the vestibule, the proötic bone has a small extension, terminating in a vertical border. In front of this is the huge vertical foramen through which issues the trigeminus nerve, which is even larger than that found in the Testudinata and Crocodilidæ. The anterior border of this foramen is formed by

*For a definition of this family and the included genera, see Proceedings of the American Philosophical Society, 1880, p. 45.

†See Journal Academy Philadelphia, 1866, p. 105, where the characters of the skull in the Urodela are pointed out.

the probable alisphenoid, whose posterior edge is nearly parallel with the anterior border of the proötic, sloping forwards as it descends. The basicranial axis is thin at their union on the middle line below, and, thickening forwards, is excavated by rather small conical fossa. Anterior to the fossa is a smaller impressed fossa, and on either side of it, each lateral wall is excavated into a shallow fossa which descends towards it. The frontoparietal fontanelle is of extraordinary size.

1. The Brain.

When the superior border of the medulla oblongata at the foramen magnum is placed horizontally, the axis of the brain ascends at an angle of 45° towards the frontoparietal fontanelle. The superior surface, anterior to the foramen magnum, is subquadrate in outline, the angles being truncated, and directed anteriorly, posteriorly and laterally. A posterior constriction connects it with the medulla; and an anterior one defines the middle brain and hemispheres. Each lateral truncated angle represents the foramen of the trigeminus nerve. The space thus bounded is divided into two nearly equal areas by a transverse groove, which extends from the posterior edge of one of these foramina to the other. The posterior of these I suppose to represent the cerebellum, and the anterior the optic thalami. The cerebellar surface indicates that, as in many lizards, the cerebellum is simple, and very slightly convex.

Anterior to the foramen trigemini, the brain contracts so as to have a transverse diameter scarcely more than one-third its vertical diameter. The cast at a point twice as far in advance of the cerebellar line as the fore and aft width of the cerebellum, rises to fill the frontoparietal foramen, forming a mass which represents the huge pineal sac or epiphysis. The proportions of this body are even greater than they are in any of the existing Lacertilia, and it has a greater transverse diameter than the middle brain inferior to it. Its posterior border is at right angles to the line continued forwards from the superior border of the medulla oblongata at the foramen magnum. At its posterior base a flat horizontal process, as wide as the brain at this point, extends posteriorly in a corresponding fossa of the superior cranial wall. Its posterior margin occupies a transverse groove of the superior wall between the superior and inferior plates. Each lateroposterior angle is produced, and may represent the foramen of exit of a narrow canal which appears to perforate the lateral wall and issue beneath the roof of the temporal fossa. A larger projection of each side of the base of the epiphyseal mass occupies a large foramen of the lateral wall, which has the superior wall for its superior border. This may only represent a vacuity of the wall, but the fossa at the posterior base of the epiphysis has greater significance. What this is I am at present unable to ascertain.

Below the epiphysis the transverse diameter of the brain is about one-fourth the vertical, not including a short inferior prominence. The latter is small and conical, and is situated below the center of the epiphysis

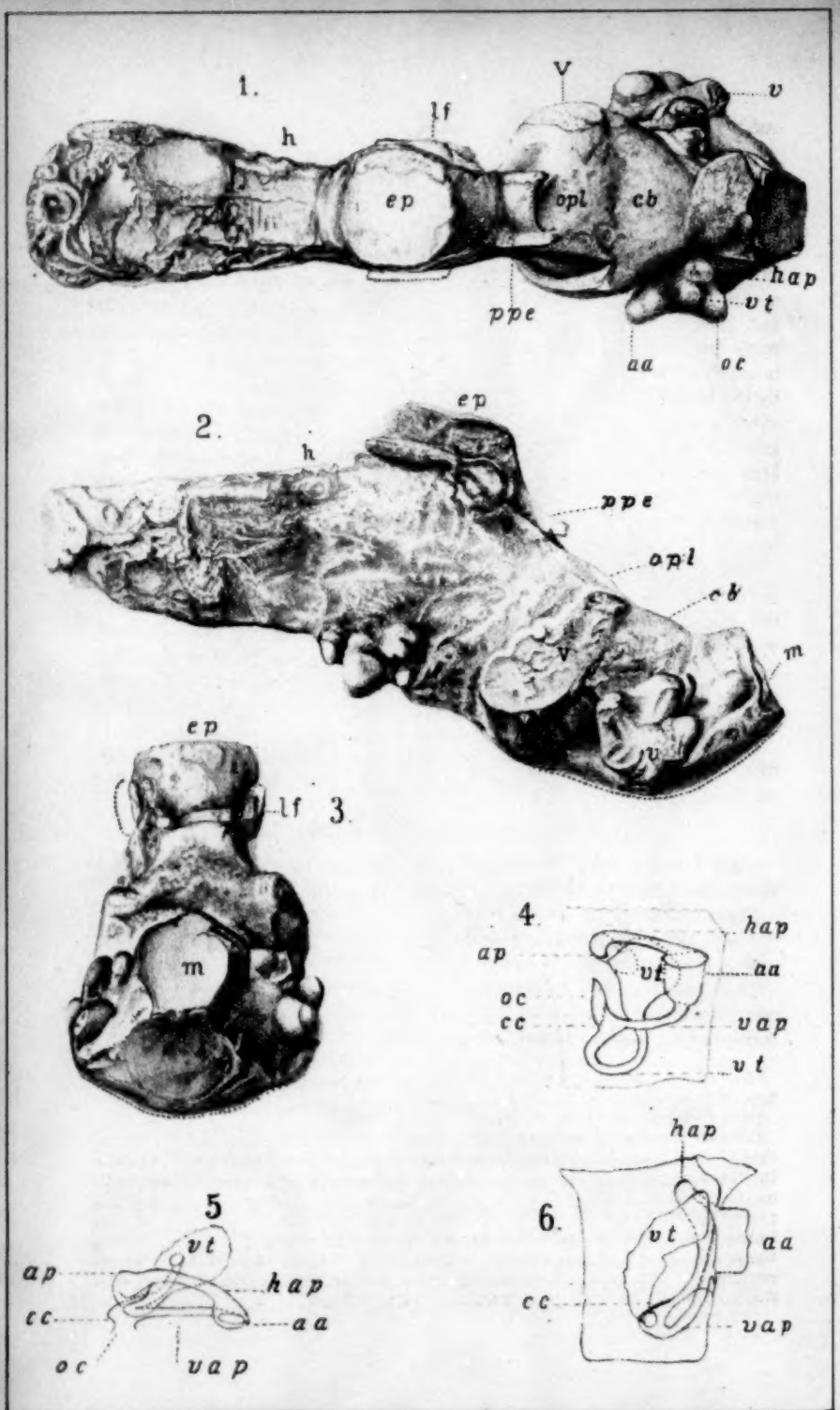
when the cerebellar surface is placed horizontally, or in front of it, when the medulla at the foramen is placed horizontally. Its significance is unknown to me, as it is anterior to the position of the hypophysis. A thickening of the cast on either side of its base converges to the median line posterior to it. I can find no optic foramina, and believe, therefore, that the optic nerves issued from the same large sinus as the trigeminus. The cast diminishes in vertical diameter anterior to the inferior conical process, and increases in transverse diameter of its superior surface. The inferior border continues to be keel-like, so that a vertical section is triangular with the base superior. It is impossible to distinguish the outlines of the cerebral hemispheres or the olfactory lobes, both of which are probably included in this part of the cast, although the latter probably extended much anterior to the extremity of the brain case as preserved. The form may or may not give an idea of the forms of the hemispheres. In any case they were narrower than in any known reptile.

The prominent features of this brain are then the following: The widest part is at the origin of the trigeminus nerve. Both the cerebellum and optic thalamus are flat and simple. The hemispheres are narrower than the segments posterior to them, and of greater vertical diameter. The epiphysis is enormous, and sends a process posteriorly between the tables of the parietal bone. The olfactory lobes were apparently large, and had a greater transverse diameter than the hemispheres. The reduced diameter of the hemispheres is a character of fishes and Batrachia rather than of reptiles, but the thalami are also smaller than is the case in Batrachia. The small, flat cerebellum is rather batrachian than reptilian.

2. The Auditory Apparatus.

As already remarked, the internal wall of the vestibule is not bony, so that the cast of the brain cavity includes that of the vestibule also. On the external wall of the latter are the orifices of the semi-circular canals. These are, one double fossa at the superior anterior part of the wall; a second double one at the posterior superior part of the wall, and a single orifice at the inferior posterior part of the wall. The external part of the vestibule is produced upwards and outwards to the fenestra ovalis. The "double fossæ" above mentioned are the osseous representatives of the membranous ampullæ at the junction of two pairs of semicircular canals.

On sawing open the periotic bones, which here form a continuous mass, the following is seen to be the direction of the semicircular canals. The superior canal is horizontal. The second canal from the posterior ampulla, descends forwards, and after a course a little longer than that of the horizontal canal, turns posteriorly. The inferior canal from the anterior ampulla also descends, and after a shorter course than the canal last mentioned, also turns backwards and joins it, the two forming a single canal, which enters the vestibule by the single posterior foramen already described. The lumen of the longer perpendicular canal is much larger than



Brain and Internal ear of Diadectidae.

that of the others. As its ampullar orifice is also the largest of all, I suppose this increased diameter to be partly normal; but it may be partly abnormal, as its walls are irregular and rough.

The fenestra ovalis is not preserved in this specimen, but can be seen in the crania of the species *Diadectes phaseolinus* and *Empedias molaris* above mentioned.* The vestibule or a diverticulum from it is produced upwards and backwards, and terminates in a round os. This is clearly not a tympanic chamber, nor is it a rudimental cochlea. It does not appear to be homologous with the recessus labyrinthi, since that cavity is not perforated by the fenestra ovalis. It appears to be a prolongation outwards of the vestibule and sacculus, which may be observed in a less degree in the genus Edaphosaurus (Cope), also from the Texas Permian formation. Here the adjacent bones are produced slightly outwards, and the fenestra ovalis is closed by a large stapes similar in external form to the one I have described in the *Clepsydrops leptocephalus*.† Its more intimate structure I have not yet examined. ‡

The result of this examination into the structure of the auditory organs in the Diadectidæ may be stated as follows: The semicircular canals have the structure common to all Gnathostomatous Chordata. The internal wall of the vestibule remains unossified as in many fishes and a few batrachians. There is no rudiment of the cochlea, but the vestibule is produced outwards and upwards to the fenestra ovalis, in a way unknown in any other family of vertebrates.

I may add that in the specimen examined, the semicircular canals were filled with a white calcareous powder, probably derived from the comminution of otolites.

EXPLANATION OF PLATE.

Figs. 1, 2 and 3 cast of cranial cavity, natural size. As the basicranial axis is lost, the inferior outline posteriorly is provisional only.

Fig. 1, from above.

Fig. 2, from the left side.

Fig. 3, from behind.

The letters signify as follows: *m.*, medulla; *cb.*, cerebellum; *opl.*, optic lobe; *ep.*, epiphysis; *ppe.*, posterior process of epiphysis; *lf.*, lateral foramen; *h.*, region of cerebral hemispheres; *v.*, cast of vestibule; *hap.*,

*See skull of *E. molaris*, Proceedings Amer. Philosoph. Society, 1881, Plate v, figs. *a* and *b*, where the fenestra is represented.

†See Proceedings Amer. Philosoph. Society, 1884, p. 41.

‡Professor Owen has figured (Todd's Encyclopedia, art. Monotremata) a structure in Echidna, which looks remarkably like that here described. This is a tubular elongation of the meatus auditorius externus with more or less cartilaginous walls. This structure might be regarded as homologous with that displayed by the Empedias, could we imagine that with their diminution in size in the Monotreme, the ossicula auditus had retreated within this tube preceding the membranum tympani, from a position at its distal, to one at its proximal extremity. But such a supposition has as yet no foundation, and the very similar parts in the two types may have no homology.

do. of orifice of horizontal anteroposterior semicircular canal; *vt.*, do. of vertical transverse canal; *oc.*, do of os commune of vertical anteroposterior and vertical transverse canals; *aa.*, do. of anterior ampulla; *V.*, cast of foramen of fifth pair of nerves.

Figs. 4, 5 and 6 diagrams of the semicircular canals, natural size.

Fig. 4, interior view.

Fig. 5, anterior view.

Fig. 6, inferior view.

The letters signify as follows: *aa.*, anterior ampulla; *ap.*, posterior ampulla; *hap.*, horizontal anteroposterior canal; *vap.*, vertical anteroposterior canal; *vt.*, vertical transverse canal, enlarged in its upper portion, probably accidentally; *cc.*, canalis communis of the vertical anteroposterior and vertical transverse canals; *oc.*, os commune of do.

Notes on the Mangue; an extinct Dialect formerly spoken in Nicaragua. By Daniel G. Brinton, M.D.

(*Read before the American Philosophical Society, November 20, 1885.*)

Sources. Nothing whatever has been published about the Mangue language, except a list of ninety-five words, by Mr. E. G. Squier in his work, "Nicaragua, its People, Scenery and Monuments." Whence he obtained this short vocabulary he does not state; but it is evidently the work of some one only slightly acquainted with the character of the language. I do not make any use of it in the present notes, except in a few instances for comparison.

My authorities are, first, Don Juan Eligio de la Rocha's *Apuntamientos de la Lengua Mangue, MS.* The author was born in Granada, C. A., June 15, 1815. By profession a lawyer, his taste led him to the study of languages, and he acquired a fluent knowledge of French, English and Italian. He was appointed instructor in French and Spanish grammar in 1848 in the University of Leon, C. A., and ten years later, 1858, published his *Elementos de Gramàtica Castellana* (Leon, 1858, small 4to, pp. 199). His death occurred in 1873.

While living in Masaya in 1842, he became interested in the surviving remnants of the Mangues, and undertook to collect materials for a study of their language. Unfortunately, he never completed these investigations, and many of the sheets on which he had recorded his notes were scattered. A few of them, how-

ever, were in the hands of his brother, Doctor Don Jesus de la Rocha, of Granada, who gave Dr. C. H. Berendt an opportunity to copy them in 1874.

In that same year, 1874, Dr. Berendt collected the last obtainable fragments of the Mangue. In his (printed) lecture before the American Geographical Society in 1876, he thus describes his efforts in this direction, and at the same time points out the localities where the Mangue speaking populations where located when they first came to the knowledge of the invading whites.

"The Spaniards on entering the present State of Nicaragua from Nicoya bay, and then marching through the country, came into contact first with the southern section of the Chorotegas or Mangues, as they were also called; then with a Nahuatl tribe, whose capital and king are mentioned as bearing the name of Nicarao; and after these again with Chorotegas or Mangues, who, however, did not occupy the whole tract of land up to the Bay of Fonseca, but were again separated from the Chorotegas on the shores of that bay by another foreign tribe called Maribios. Thus we obtain the three sections into which the Chorotegas of Nicaragua were divided at the time of the Conquest. Now, their language seemed to me an object worthy of having some special attention bestowed upon it—not so much for its own sake, but in order that a better understanding might be arrived at of the ethnological features of Nicaragua, which, on account of an insufficient acquaintance with its actual condition as well as with the early writers, and of the rather precarious speculations and conjectures of modern authors based upon such scanty knowledge, have become greatly confused. Having studied the Chapanecan language on a former expedition, and wishing to compare it with the Chorotegan, I visited Nicaragua in the year 1874. I found that the Indian population near the Nicoya and the Fonseca bays had entirely disappeared, and in both districts only met with some local names belonging to the Chorotegan language. In the third district also, where descendants of the old stock are still living in twelve villages around the lakes of Masaya and Apoyo, I was informed that no other vestiges of the old idiom were left, the inhabitants speaking exclusively the Spanish language. I had, however, the good luck to ferret out some old people who still remembered words and phrases they had heard in their childhood; and I was enabled to collect material sufficient to convince myself and others of the identity of this Mangue or Chorotegan idiom with the Chapaneco language of Mexico. I was not a moment too early in obtaining this information, for the greater number of my informants died while I was staying in the country. I still hope that with the knowledge of the Chorotegan thus gained in Nicaragua and Chiapas, it may be possible to trace their history and descent backwards

to one of the nations that were living in Anahuac in the earliest times of which our records speak."

The materials were never published by Dr. Berendt, nor, indeed, did the many other projects which occupied him allow him the leisure to collate and arrange them. I have taken them from his original notes, often in pencil and not always perfectly legible. But I believe those here offered can be depended upon as accurate, and have special value as the sole remaining vestiges of an idiom now wholly extinct.

Synonyms. It will be seen that Berendt speaks of this people as the "Chorotegas or Mangues." I have given the origin of these names in the Introduction to "The Güegüence, a Comedy-Ballet in the Nahuatl-Spanish Dialect of Nicaragua," published as Number III, of "Brinton's Library of Aboriginal American Literature" (Philadelphia, 1883). They adjoined on the north-east and south-west the Nahuatl-speaking tribe, who occupied the narrow strip of land between Lake Nicaragua and the Pacific ocean.

"They were of one blood and one language, and called themselves *Mánkeme*, rulers, masters, which the Spaniards corrupted into *Mangues*. The invading Aztecs appear to have split this ancient tribe into two fractions, the one driven toward the south, about the Gulf of Nicoya, the other northward, on and near Lake Managua, and beyond it on Fonseca bay. Probably in memory of this victory, the Aztec Nicaraguans applied to them the opprobious name, *Chololteca*, 'those driven out,' from the Nahuatl verb *choloa*, in its compulsive form *chololtia*, and the suffix, *tecatl*, people; which was corrupted by the Spaniards into *Chorotegas*." (*The Güegüence*, Introduction, p. viii.)

In Squier's work above referred to they are called "Chorotegans or Dirians." The latter is from the Mangue *diri*, a hill or mountain, and was applied to that portion of them who dwelt in the hilly country south of Masaya.

The Spanish form of their native name is that which I should recommend for adoption in ethnological works.

Early Notices. The old historians and travelers, on whom we depend for our knowledge of Nicaragua, tell us practically nothing about this language, and little about the people who spoke it. The chieftain, called Nicoya, living on the bay of that name, was first visited by Captain Gil Gonzalez Dávila in 1523. The natives were estimated at about six thousand, who received

the Spaniards in a friendly manner, and gave them considerable gold.*

Oviedo in his *Historia de las Indias* gives a few words of the language as follows:

mamea, hell.
nam bi, dog.
nam bue, tiger,

the last two of which correspond to those in later vocabularies.†

The Auditor Garcia de Palacio (1576) mentions the Mangue as spoken in Choluteca, Nicaragua and Costa Rica, in the last mentioned as introduced from elsewhere.‡ About a century later a colony of Mangues, several hundred in number, were found by Juan Vazquez de Coronado, almost at the extreme eastern end of Costa Rica, in the Province of Pacaca.§ Those on the Pacific Coast, about the Gulf of Nicoya, were accustomed to cross to the ocean on the north for trading purposes, and to obtain salt.‖ They appear to have been a people of moderate cultivation, and rather extended commercial connections.

Affiliations. The Mangue is the mother tongue from which the Chapanec (or Chiapanec) of Chiapas branched off. The separation from the ancestral tribe, and the migration from Nicaragua to Chiapas, were distinctly remembered by the Chapanec off-shoot when first encountered by the whites. Remesal, in his well-known history, gives a brief but clear account of it.

The date of this occurrence cannot be specifically stated, but its occasion can be readily surmised. The Mangues at one time occupied the whole coast from the entrance of the Gulf of Nicoya to Fonseca bay. At a period which we may locate some time in the fourteenth century, a large colony of Aztecs descended the coast and seized the strip between Lake Nicaragua and the Pacific, thus splitting the Mangues in two, and driving a large portion of them out of their homes. Some of these wanderers remained with their relatives, but one body of them marched north and west until they reached a lofty peak on the

* Letter of Gil Gonzalez Dávila to the Emperor Charles V, in *Costa-Rica, Nicaragua y Panama en el Siglo* xvi, por D. Manuel E. de Peralta, p. 9 (Madrid, 1883).
† *Historia General y Natural de Indias*, Part iii, Lib. iii.
‡ Palacio, *Carta al Rey*, Ed. Squier, p. 20.
§ See the Report of Coronado in the collection of Peralta above quoted, p. 777.
‖ Ibid, p. 704.

Rio Grande in Central Chiapas, where they constructed a formidable fortress, and became the terror of their Nahuatl-speaking neighbors.*

No connection has been demonstrated between the Mangue (or Chapanec), and any other North American language, although owing to the liberal exertions of M. Alphonse Pinart, we have now in print and easily procurable, a grammar and a number of texts of the Chapanec dialect.†

A comparison, the partial results of which I have previously published, proves that the differences between the Chapanec and Mangue are slight and unimportant, and for purposes of collation with other stocks the two may be looked upon as identical.

In the Introduction to "The Güegüence," I pointed out some singular coincidences between the Mangue and the Aymara of Peru. Further examination of the two tongues has not added to the list given, and has weakened the belief I entertained of some possible connection in the past between them.

I take this occasion to point out an error which has crept into several philological works, that of confounding the Mangue with the Nagrandan of Nicaragua. Thus, Francisco Pimentel, in his work on the languages of Mexico, falls into the capital mistake of declaring the Chapanec of Chiapas to be allied to the Nagrandan of Nicaragua; and to prove his assertion, gives a list of alleged Nagrandan words, all of which belong to the Mangue tongue!‡

The same confusion marks an attempt of Mr. Hyde Clark, of

* "Vinieron antiguamente de la Provincia de Nicaragua unas gentes que cansados de andar y de las descomodades que la peregrinacion træ consigo, se quedaron en tierra de Chiapa, y poblaron en un peñol aspero orillas de un Rio Grande que pasa por medio della y fortificaronse allí, porque nunca se quisieron sujètar á los Reyes de Mejico, antes tenian continuamente guerra con sus capitanes." etc. Remesal, *Historia de Chiapa y Guatemala*, Lib. iv, cap. xiii.

† *Arte de la Lengua Chiapeneca.* Por Fray Juan de Albornoz.

Doctrina Cristiana en Lengua Chiapaneca. Por Fray Luis Barrientos.

These two publications comprise Vol. i of the *Bibliothèque de Linguistique et d'Ethnographie Americaines, publiée par* Alph. L. Pinart (Paris, 1875).

Dr. Berendt states that the natives pronounce the name of the province *Chapa*, not *Chiapa*, and that the word is the Mangue *Chapa*, which means their sacred bird, the Ara or Guacamayo, from which they named their fortress in the State of Chiapas. Father Juan Nuñez, who was missionary among them about 1620, and who preached and wrote in their tongue, also called it "la lengua Chapaneca." See Brasseur (de Bourbourg), *Bibliothèque Mexico-Guatemalienne*, pp. 109, 110.

‡ *Çuadro Descriptivo de las Lenguas Indigenas de Mexico*, Tomo iii, p. 559 (Mexico. 1875).

London, to bring into relation "the Masaya language of Nicaragua with the Sioux language." The words he quotes as from Masaya are all from the Nagrandan of Subtiaba, near Leon. There is really no relationship between the Nagrandan and Mangue, and although Dr. Latham has attempted to indicate some few analogies,* they must be deemed quite accidental.

A comparison of about 125 words of the Mangue with the Mixteca, which I find among the Berendt MSS., reveals only about half a dozen similarities, all apparently accidental.

Phonetics. The Mangue words in this paper are principally in letters with the Spanish powers, some of the semi-vowels being in smaller type. The *h* is pronounced as an aspirate, and is equivalent to the *j*, which has its aspirated Spanish value.

All syllables are open; that is, they all end in a vowel sound. Thus *nimbu*, water, is to be divided *ni-mbu*. In this respect it resembles the Cherokee, the Japanese, etc.

Dr. Berendt stated that the Chapanec dialect was the most difficult of any American language he had ever studied, on account of the obscurity and uncertainty of its sounds. It is greatly syncopated, and terminal syllables are often pronounced in so low a tone that they escape the unpracticed ear. The vowels are not distinct, and many of the consonants are "alternating" as it is called, that is, one may be substituted for another without altering the meaning of the word. Thus, evil spirit (*demonio*) may be either *tixämbi'* or *sisa'mb"i*, these two being the same word pronounced indifferently, either way, by the same individual. This is by no means without parallel in American languages.

The curious frequency in the Mangue of the "resonants" *n* and *m* will strike every observer. This is also the case in the Chapanec. Albornoz regards it as a phonetic phenomenon only, and remarks, "Whenever a word begins with *b*, *g*, *y* or *d*, an *n* must be written before it, which is pronounced with the word itself." Dr. Berendt calls it an "article" which appears as *n*, *na*, *ni*, or *m*, especially before the letter *b*. As such, I may suggest its similarity to the Nahuatl *in*, and the Othomi *na*, both of which are demonstratives worn down almost to articles.

There is a similar resonant nasal in various South American

* Latham, *Essays, chiefly Philological and Ethnographical*, p. 373 (London, 1880).

tongues, especially the Tupi-Guarani dialects of Brazil. It appears most frequently before the consonants *b* and *d*. Its peculiarity is that it is not an expiratory sound, but a soft *inspirate*, and as such is claimed by Dr. Nogueira to be a phonetic phenomenon confined exclusively to American tongues.* I have been unable to decide from the descriptions within my reach of the Chapanec phonetics, whether the initial resonant is an inspirate, and I would call the attention of travelers to this interesting point.

In addition to this simple resonant prefix there are a number of particles beginning either with *n* or *m*, which are added to indicate the absolute or independent form of the noun, that is, to characterize it when not attached to a personal possessive pronoun. Of these Albornoz gives fourteen for the singular, and seven for the plural. This will explain the striking prevalence of words beginning with these letters in the vocabulary.

Accent is of the utmost importance in both these dialects, and the identity to the eye of various words as *nyujmi*, ear and smoke, arises from absence of proper accent marks in my authorities. The words for bird, snake and flower are the same; but Albornoz gives this very example to illustrate the importance of accent, *nolõ*, a snake, *nolô*, a flower. Unfortunately, none of my authorities employ any accentual mark but the acute, and this appears to be syllabic. A vowel written above the line of the word, in Berendt's MSS., signifies a semi-vowel.

Structure. The general structure of the Mangue was clearly polysynthetic and incorporative in a marked degree. In its grammar it was no doubt identical in all essential points with the Chapanec, about which, as above mentioned, we have considerable information in published sources. Nominal and verbal forms are defined by the categories of animate and inanimate genera, a distinction which is to a certain extent purely grammatical, as for instance, a book is considered animate, and a table inanimate (Albornoz, *Gram.*, cap. xiii). The first person plural has an inclusive and exclusive form. Adjectives usually, but not always, follow the nouns. Plurals are frequently formed by simply lengthening the terminal vowel sound.

*See the excellent work of Dr. B. C. A. Nogueira, *Apontamentos sobre o Abañeenga tambem chamado Guarani ou Tupi*, pp. 56, 57 (Rio Janiero, 1876).

The Vocabulary. The words in the vocabulary have been obtained from the Rocha and Berendt MSS. Where these two authorities differ the variants are indicated by the affixed initials, R. and B. All words quoted for the sake of comparison from Squier, are marked by an affixed S. The observations, explanations and other remarks attached to the words and phrases are my own. The comparative expressions taken from the Chapanec (marked, *Chap.*) are from the printed works above mentioned, or from MS. vocabularies of various authorship in my possession.

All of Rocha's words are from the dialect of Masaya; but Dr. Berendt obtained some at the villages of Masatepec, Niquindomo, and Namotiva′, and this explains the occasional variants given. The differences, however, between the speech of these localities was evidently slight.

Vocabulary: English–Mangue.

Achiote, nariyu. (The *Bixa orellana*, a fruit tree; *achiote* is Nahuatl).

Aguacate, nirimo′, narimu. (Fruit of the *Persea gratissima*).

Ancestor, kopo′. The same as *old*, q. v.

Ancestress, kapoi. Apparently a feminine form of *kopo*, old.

Anona, naria′. Fruit of the *Anona squamosa*.

Ant, an, náju, na^{a}.

Ara, lapa; *Chap.* txapa. The *Ara macao*, of ornithologists.

Arm, ndiro. Compare *hand*, and *finger*. Properly "the upper extremity." S. deno. *Chap.* gulu^{a}a.

Armpit, ngisa. Compare, *beard*. Perhaps "hair of the armpit."

Armadillo (*Dasypus*) nyuku′. Compare *lizard*.

Ashes, nitsu, nisú.

Atole, nambo. (A dish prepared from maize.)

Bad, gangame, ganyame. Properly *not-good*.

Bark, nanso^{u}a′.

Basket, naj^{u}ari.

Bat, nyuta′.

Bean, nyumú.

Beast, nyumbú. Compare *tiger*.

Bear, to (to bear children) pindih.

Beard, gísa.

Bed, nakutá.
Bee, nopopo.
Beetle, nag^{n}a.
Belly, ngusi.
Bird, nori, nyuri′. Compare *snake* and *flower*. *Chap.* nuri.
Bitter, yasi.
Black, nansome.
Blood, nijnyú; S. nenuh.
Blue, nandipame.
Body or Flesh, nimbrome, nampoome.
Bone, nyu^{i}.
Bowels, ngita.
Boy, nasome; R. norome; little boy, noromiñamu.
Branch (of a tree) ndiro nya; = "its arm, tree."
Brandy, nimbuyasi; = " water, bitter."
Brave, pusit^{i}u.
Brook, nanda.
Brother, manku, mambo.
Brother, younger, mambo nyamo nasome.
Buttocks, bojo^{i}; nbasi, basti′.
Cacao, nyúsi.
Camote, yujmi (an edible root).
Cane, sugar, niriómbome.
Cantaro (a water jar), natiyojpo.
Casava, see *yuca*.
Cat, misa, mixa.
Cat, wild, misa se nirome; = " cat of the forest."
Chachalaca, tásara. A kind of partridge called, in Nahuatl, *chachalacatl*.
Chalchihuitl (a green stone, Nah.), nyu se rayo; the last word, *rayo*, is Spanish, and the expression means " stone of the lightning," the belief being that these stones are thunderbolts.
Cheek, girote. Compare *face*.
Chief, ruler, mánkeme. *Chap.* manaχämä, from *χimá*, the head. See *The Güegüence*, Introd., p. viii, note.
Chief, female, najyumbu.
Child, nasungi.
Chile (a sort of red pepper), ningi.
Chocolate, nimbu nyusi; = " water-cacao."

Chocollo (a bird), naturi.
Church, nakúmbui.
Clay, nambroj.
Clay, potter's, nambrój se nati; = "clay of jars."
Cock, a, norij^{a}é.
Cockroach, nambisa.
Cocoyol, neme; a species of palm.
Cold, poro′, yoro, oro.
Collar, or necklace, bakoya′jo.
Comal (a dish or plate), nambujyo^{i}.
Come, to, na.
Conch-shell, txote.
Cook, a female, naka^{i} nakupasi. Comp. *kitchen.*
Corn-field, namasinyu′, ndam bur′rio.
Cotton, naroti′.
Cotton, thread of, tapakúsime naròti.
Dance, to, tasosmo.
Daughter, banya nasinyamo. Comp. *son* and *girl.*
Daughter-in-law, mbájtioro.
Dead, ko^{i}jme. Comp. *to die.*
Deaf, gungupajo; = not hearing.
Deer, nyúmba ngami.
Devil, natamasimo.
Die, to, naga^{a}nyu; *imper.* koijme.
Dish from a gourd, nambira. Comp. *water.*
Distant, ha^{i}tsu.
Door, nya síyu.
Drink, to, *imper.* koi ri (?).
Drum, nyunsú. Comp. *jicara.*
Dog, nyumbi′.
Dog, female, nyumbi nyaka^{i}.
Ear, nyújmi.
Earth, land, nikupu′, nambrome.
Eat, to, nasu, *imper.* ko^{i}ta′.
Egg, nyuga-yori. Comp. *bird.*
Egg-shell, nanso^{u}a. Compare *bark.*
Enclosure, mendí.
Enclosure of stone, mendi nyu^{a}.
Excrement, nig^{u}a.

Eye, nate.

Face, ngroti. Compare *cheek*.

Father, k^{u}é; kújk^{u}e; S. gooha. R. coehyo.

Feather, napa yorí.

Female, of animals, nyaka.

Finger, ndiro. Compare *arm* and *hand*. *Chap.* banya dilá.

Finger nail, monsu′, munsú.

Fire, nyayu, naku; S. nahu.

Fish, nyujú.

Flatus, píj^{i}.

Flea, louse, etc., nyu^{i}.

Flesh, for eating, nampumi.

Flint, nyupa nyugo. Compare *stone*.

Flower, nyuri, niri. Compare *bird*, and *snake*

Fly, a, nimbrome.

Food, nyumuta. Comp. *bean*.

Foot, ngirá.

Forehead, gula.

Forest, nijome, nmandi.

Fork, a, nya nangu. Compare *house*. Probably the forked stick, which supports the ridge-pole.

Friend, ngurí; manku. Comp. *brother*.

Frog, natakopó. Comp. *toad*.

Fruit, narime.

Gall, bayatimé.

Gaspar, nyuju yansu. A fish sometimes called the "lizard fish."

Girl, nasunyamo. R. najiñamu.

God, kupankeme Dio; nikus′p^{u}a. (Our Lord.) *Chap.* kop-andχame; *comp. chief*. S. gopahemedeo.

Good, pami, pame, yame.

Great, yok^{u}e, yok^{u}eme.

Green, apame, yapame.

Guacal (small dish), narí.

Guayabo (a fruit), nikonyo′.

Hair, nimbi′.

Half-breed, nyukús^{u}a.

Hamack, nyu. Comp, *mecate*.

Hand, ndiro. Comp. *arm* and *finger*. *Chap.* di^{i}la.

Hat, nimpe.
Hatchet, nimunguyá.
Hawk, nake′.
He, pron. neje.
Head, ngu′ kimo.
Heart, nambume.
Heaven, sky, nakup^{u}i; nakujpu.
Heavy, arime.
Hedge, or fence. See enclosure.
Henequen (a fibrous plant), notome.
High, opome.
Hoe, bajarítojo.
Hog, nyuju.
Hog, wild, nyuju mandi. Comp. *forest.*
Honey, nambo′ pu, nombó.
Horn, nimbomo.
Horse, nyumpie′. Comp. *tapir.*
Hot, tsujmu, yátsumu.
House, nangu, nge.
Husband, boh^{u}e. Comp. *man* and *male.*
Iguana, nyumbu. Comp. *animal, beast.*
Indian, an, namba′jimo.
Jar, of pottery, nimbúgu.
Jicaro (tall jar), nyúnsu.
Kill, to, tambajme.
Kitchen, nakupasi.
Lake, ninda.
Leaf, nyuma′.
Leg, ngiko.
Light, *adj.* ngári me; = not-heavy.
Lightning, kŏyo′mo (?).
Lion, couguar, nyumbú nyangami. Comp. *deer.*
Little, kame; R. ñamu.
Lizard, nyukú.
Low, nyamo. Comp. *small.*
Macana (an iron implement for cutting brush), nampúj.
Mecapal (a net for carrying loads), napalumu.
Machete (a heavy knife), nímb^{i}u.
Maize, namá.

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Maize, ear of, nyupó.
Maize, cob of, neje'.
Maize, green, nyopome.
Maize, cooked (nistamal), nyu'ritu.
Maize, masa of, nambima.
Male, of animals, j^{u}e, f^{u}e.
Mamma, su ngitsu, ngisu.
Man (homo), ndijpu. *Chap.* dipaju.
Man (vir), nyugo, nojue, enkaj; S. nuho. *Chap.* nu^{u}a.
Mantle, of cotton, nambu sángui; R. nimbu ranguma.
Married man, koipujma nasominyamo.
Married woman, nojí.
Mat, nuri.
Metapail (hand-stone for pounding grain), ndiro nyupa (hand-stone).
Metate (mealing stone, mortar), nyupá; = *stone.*
Mill woman, a, nasinyamo tapa' kup^{u}i.
Mole, nyu'kupu. Comp. *armadillo.*
Money, najmo.' Comp. *silver.*
Monkey, nambi.
Moon, yu. *Chap.* yujú.
Mother, ngumo; nyame; ngimo; S. goomo. R. guirmoh.
Mountain, hill, tiri, diri.
Mouth, nyunsu; R. ñunzu.
Much, pókopi.
Musquito, néju.
Nacatamal (maize cooked with flesh), nyuga mpume. Comp. *tamal.*
Navel, ngutinyamo.
Near, kopunapu.
Neck, nko^{i}.
Negro, a, nanso'me. Comp. *black.*
Nephew, batsún kényamo.
Nest, ngä. Comp. *house.*
Net (for carrying), niskupu, namu.
Net (for fishing), najkupu; niskupu se yuju.
Night, koyujmi (it is now night).
No, áku.
Nose, nyungú; R. nuñgu.

Old, man, kopo′. Comp. *ancestor*.
Old woman, naka^{l}, naska^{l}me.
Opossum, niyú.
Orphan, butájmu.
Pain, gaime.
Parrot, nimbusojo.
Pearl color (nacar), narimbame.
Pebble, nipa. Comp. *stone*.
Penis, bu^{n}yore.
Petticoats, nimbusame; nambusangume. Comp. *mantle*.
Pigeon, nyurinyamo.
Pineapple, nindi.
Pinole (maize roasted and pulverized), nambari.
Pisote (a badger?), nyundi.
Plantain, green, nirinte, nikotona.
Plantain, ripe, ndurime.
Plate (of dried gourd), nambira.
Pleiades, the, napopo.
Poor, nambájimo, nambainjume.
Pretty, tapustxuya.
Priest, ku^{n}jk^{n}é.
Privates (female), sungip^{n}ai motxo′tete.
Rabbit, nyuku. Comp. *lizard*.
Rain, nimbu. Comp. *water*.
Rat, nangi.
Red, arimbome.
Reed, néjeri.
Rind (peel), nanso^{n}a′. Comp. *bark*.
River, neju.
Road, niro.
Roof, nimú, nakamu′.
Room, apartment, nakangu. Comp. *home*.
Rope, string (mecate), nyu^{l}.
Sacate (a species of grass), nimú, nakamo.
Saliva, nimbójmo.
Salt, niri.
Sandal, or moccasin, nyansu, ninsu.
Sapote, red (a fruit), noxa′, nyuxa′.
Scorpion, nyumbukukí.

Sea, nimbu yumbu,
She, pron. neja. See He.
Shirt, for men, mboyú.
Shirt, of women, nayu.
Shore, ninda. Comp. *lake.*
Shoulder, inku[1].
Silver, najmo. Comp. *money.*
Sing, to, undamo.
Sister, boronyamo, mambo. Comp. *brother.*
Skin, hide (of animals), nínsu, nansú, nyún su.
Sleep, to, nagu.
Small, txote, nyamo. Comp. *low.*
Smoke, nyujmi; S. nemare.
Snake, nyurí. *Chap.* nulú. Comp. *bird* and *flower.*
Son, banya.
Son-in-law, ngismó.
Sorcerer, nyu^{n}ja.
Sour, yagu.
Speak, to, nata, *imper.* papa'me.
Squirrel, naré.
Star, nyutí; R. nuti; S. nuete. *Chap.* nahuiti.
Stone, rock, nyupá (pl. nipa).
Stool, nambu ku ta'.
Sugar, nombó. Comp. *sweet.*
Sun, nyumb^{n}i, nomo; S. numbu. *Chap.* mapíju. Comp. *moon*
Sweet, nombo'.
Tamal (a dumpling of sweetened maize), nyuga.
Tapir, the, nyumpié mandi. Comp. *forest.*
Tear, a, nimbu nate. Comp. *water* and *eye.*
Tenamaste or cooking stone, hajmi nyugu (three stones), nakupasí (see, to cook), nikusugo'.
Thief, tiposi'tinyo.
Thorn, ni, nindi.
Thunder. Koi tapu'meme; lit, "it thunders."
Thrush, nyúj^{n}a. A species of *Caprimulgus.*
Tick, nambisá, nansumá.
Tiger, jaguar, nyumbú. Comp, *animal.*
Tiste (a drink of cacao, etc.), nimbyusi. Comp. *water.*
Toad, natakopó.

Tobacco, nyumurime; nimburime; S. nemurema. To smoke tobacco, fasomo nimbu rimi

Tomate, naripo.

To-morrow, majimi. Comp. *yesterday.*

Tongue, grij^{u}í.

Tooth, niji.

Tortilla, no^{l}.

Totoposte (a kind of corn-bread), nyua yañjí.

Town, namá puma, namépume.

Tree, nya. Comp. *wood.*

Trough, nimbóya. Comp. *water.*

Turtle, of water, nyuka,

Ugly, ganyame. Comp. *bad.*

Unio (the shell so-called), nyukanyamu.

Vapor (mist, steam, etc.), ndipí

Vase (tinaja), nojpú.

Washwoman, nasinyamo tapapa′poro.

Wasp, najú (?).

Water, nimbú.

Wax, nyu.

Well (noun), kita.

Where? nde.

White, nandirime.

Wife, mboome, njujmi. Comp. *husband.*

Wind, nitiu′; níjt^{l}u. S. neshtu.

Woman, noji, nasi.

Wood, nya, nindomi (?).

Yellow, nandiume.

Yes, un; taspo (?).

Yesterday, yajimi.

Yuca (the *Yatropha manihot*), noya, nuya. *Chap.* niya.

Numerals.

1. tike.
2. ha, ja, jami, jojo.
3. hajmi, jajame.
4. hahome.
5. hagujmi.

10, jendo.

20. jajué.

800. ja^{l}mbí.

The Verb "to be," R.

I am,	cejo.
Thou art,	simuh.
He is,	neje sumu.
We are,	cis mi muh.

Pronouns.

I,	saho, S.
My,	amba, mba.
He,	neje, R.
She,	neja, R.

Phrases.

Koi múrio, It is already dawn.
Koi yujmi, It is already night.
Koi prijpi, It is already growing dark.
Koi újumbo, He has already urinated.
Koi gaimi ndiro, He gave me his hand.
Koi pajo nama siñú, I am going to die (ya me voy à la muerte).
Koi-li nimbuyati, I drank some brandy.
Koi-tā cutaca ñumbi′, I ate like a dog.
Koi-li gipomo ga muningui, I ate broth with chile.
Tagüaime ga muñunso yok^{u}e, Give me a large jar.
Tari nimbuin, on güari? Will you drink some tiste, or will you not?
Oyat us ma? How do you like it (*i. e.*, hot or cold)?
Pókopi ndijpo, } Many people,
Taku pámu ndijpú, }
Koi jini kújk^{u}e, His father died.
Muri kagro', Here is the old woman.
Ai nambunú ju, I have a pain in the belly.
Ni koi sime, You have already bought.
Pe ya puti nakutá, Go and lie down in the room.
Tiki numapuna, It is the town.
Nam bu mejo, His stomach is weak.
Koi tsujmú nimbu, The water is already warm.
Koi puró nimbu, The water is already cold.
Koi piro, He has already come.

Pami nyumuta, The food is good.
Cajo rismoh, I am seated.
Neje zumu rimah, They are lying down.
Guay cane noy, Give me a piece of tortilla.
Koi guaja, I have already given you some.
Garoh, Not yet.
Ejeh / Uji! } Take some!
Susupusca? / Kuj mi mo? } How are you?
Ko′ mi muya′ i ku? And you, how are you?
Camo cujmi umyaique, Nasi pujimo camo? There is nothing new; and you, how are you?
Gusapo, Take a seat.
Nam bro′ gatsuro yaji? Why did you not come yesterday?
Koi k^{u}eme, I was up there.
Kupa kastai, Señor, Good-by, Señor.
Nohue opome, A tall man.
Nya opome, A high tree.
Nya nyamo, A short tree.
Nyumbi yok^{u}e, A large dog.
Nyumbi pusit^{i}u, A brave dog.
Kŏyómo nikúj^{u}i nímbu, With thunder comes rain.
Ko^{i} pirami nimb^{u}í, Already comes the rain.
Tapuko kuno tipo kunyo, Let us go to see the sick man.
Munđamó, The pigeon sings.
Nde yat supu is ya? Where are you going?
Tsupu nekajui, I am going to the garden.
Munsu supu kujkui, They are (go) lame.
Ropia, Come here.
Ropia no somíngamo, Come here and sweep.
Koi apiñame naturi, The Chocollo (bird) has already cried.
Koi píndih Juaná, Joanna is with child.
Pieyas mah, She already was.
La puta (*Span.*) ansu punah, The whore that bore thee.
Cumbú puy muh, I do not remember.
Neje rumu coy cuhme, He is already a great man.
Nis puzu punah? What did she bring forth?
Naci ñamu, A little girl.

Taru miro, They are all mine.
Neja guirmiño, That is my half.
Niora múta pu ninda? Are you going to the shore?
Taspo, Yes.
Ya pu camu, In a little while.
Mu koi cu pumé, Thou hast already seen it.
Koi cu pumé, I have already seen it.
Uño! See!
Mis upa'? Where are you going?
Umimo uyako, } We are out of breath.
Pasi púJimo, }
Pangare' manijitaré, Be quiet, I will pay you to-morrow.
Gugapi, koy ujmi, Let us sleep, it is night.
Bu"si na", munikako, Get away from here, you son of a devil!
Nim bu' tajo pa'yamo? What were you doing by the water?
Tapame, Be good.
Motan atima nyumpia, You come on horseback.

Observations on the Vocabulary.

Prefixes.—The most frequent prefixes in the vocabulary are *nyu* and *nya*. They probably indicate the position of the noun as independent of expressed possessive relations. In the Chapanec they are also found, but not so commonly. They do not appear to be classificatory particles, as they are prefixed to the names of the most diverse objects.

Generic Names.—These are quite common, as is frequently the case in American languages, in spite of what has often been said to the contrary. The word *nyu-mbu* means any large quadruped; *nyu'*, any insect; *narimu*, any kind of wild fruit, etc. It must be remembered that the genera into which individuals are grouped have a widely different connotation from those to which we are accustomed.

Cat.—The word for cat, *misa*, seems identical with the Cakchiquel *mez*. In Chapanec it is *kitu*, reminding one of *kitten*. As the domestic cat was unknown in America before the discovery, these words can probably be traced to some European source.

Color Names.—The color names appear difficult to analyze, and vary from those in Chapanec. Thus, as given by the various authorities, they are:

	Mangue.	Chapanec.
Black,	nanzome, R.	dujamä.
White,	nandirime, R.	dilimä.
Yellow,	nandiume, R.	nandikumä.
Blue or Green,	nandipame, R. apame, B.	ndipamä.
Red,	arimbome, B.	nduimä.

In these adjectives the termination *me* or *mä* does not belong to the root. Father Abornoz tells us that this suffix characterizes adjectives in the singular number, when they qualify a certain class of nouns "in *tighe*." (See his *Gram.* p. 15.) The nasal or resonant beginning most of them is also a mere prefix.

Proper Names.—But few native families of the Mangue districts of Nicaraugua have retained names drawn from their ancient tongues. In a list before me of several hundred persons in Masaya and Managua, the only surnames from the Mangue are *Norori*, *Ñamendi*, *Namullure*, *Putoi*, *Nionongue*, *Macanche*, and perhaps *Huembes* and *Piura*. Generally, the natives adopted Spanish surnames.

On the other hand, a large number of local names, derived from the Mangue language, on the map of Nicaragua still define the region once occupied by this nation. Such are *Nindiria* (from *ninda*, shore, *diri*, hill), *Nakutiri* (from *naku*, fire, *diri*, hill), *Monimbe* (*nimbu*, water, rain), *Nandasimo* (*nanda*, brook), Mombonasi (*nasi*, woman), *Masaya*, *Managua*, *Namotiva*, *Norome*, *Nicoya*, *Oretina*, etc., etc.

Photography by a Lightning Flash.

By Prof. Edwin J. Houston.

(*Read before the American Philosophical Society, November 20, 1885.*)

Mr. Albert S. Barker, of Philadelphia, has recently sent me two photographic views of his stable and surrounding objects, the exposure for which were made during an exceedingly dark night, with no other illumination than a single lightning flash for each.

The photographic negatives were taken during the severe storm that

occurred in Philadelphia and vicinity on the 29th of October, 1885. The exposure was made at 7 P. M. The thick clouds produced pronounced darkness. At the same time the rain was heavy, and the wind high. Considering the circumstances, the negatives secured were very good.

The circumstances of the exposure were as follows, viz: the camera was placed in an open window, and pointed towards the stable, its focus for this point having been previously obtained. The slide was then drawn and the plate left exposed to the night until a lightning flash came. This occurred in less than one minute, when the slide was instantly closed, the plate holder reversed, and another exposure obtained by means of the illumination of the next flash.

The plates were developed during the evening. The results obtained were, in Mr. Barker's judgment, about equal to what would have been secured by an exposure of about $\frac{1}{300}$ of a second in bright sunlight at noon.

The plates used were exceedingly sensitive gelatine films. A comparatively large diaphragm was employed in these exposures.

The circumstances under which these exposures were taken were such as thoroughly prevented any illumination of the objects save by the flash itself. The room in which the camera was placed was of course quite dark.

Apart from the interest attached to Mr. Barker's photographs as evidence of the recent advances made in what is generally called instantaneous photography, they appear to present considerable value in the light they throw on the question of the duration of the ordinary lightning flash.

The views generally held as regards the duration of the lightning flash is, that it is practically, if not actually, instantaneous. From experiments made by Wheatstone and others, the duration of a flash, as determined by means of a rapidly revolving disc, it is generally believed to be from the $\frac{1}{10000}$ to the $\frac{1}{100000}$ of a second. Whatever may have been the duration of the flashes thus measured, it would appear probable that flashes of great severity, where the discharge traverses many miles of air, would, under many circumstances, continue for quite an appreciable time.

Mr. Barker's photographs appear to show that this was the case during the night in which they were taken. While the fixed objects, such for example as the stable, came out quite sharply, the trees show unmistakable evidences of violent motion. It is true that these trees were not in sharp focus, being nearer the camera than the stable. Though somewhat blurred, they nevertheless exhibit unmistakable signs of having perceptibly changed their position during the time of exposure. In other words, the plate was illumined for a sufficient length of time to permit the motion to be clearly shown. The lightning flash, therefore, was not instantaneous in the sense generally attributed to it, but continued to illumine the plate for quite an appreciable time.

It would be interesting for the photographic experiments of Mr. Barker

to be repeated under other circumstances to determine this question more certainly. For example, if the camera were focussed sharply on a distant tree, and a negative taken during a violent thunder storm by a lightning flash while the tree is in motion, if the foliage comes out in detail with no perceptible motion shown, the continuance of the illumination would then be proved to be too short a time for its appearance. If, on the contrary, the leaves appear blurred as if moved, then the generally received notions concerning the instantaneous character of the lightning flash must be changed.

Or, if the camera should be focussed on a rapidly moving wheel, and a photographic picture be taken during its illumination by a lightning flash, then the peculiarities of the negative could be utilized, not only to determine the question of the greater or less duration of the flash, but even to measure the actual duration itself.

It will be observed that the method here suggested substitutes the sensitive plate of the photographic camera for the retina of the eye. From the results of Mr. Barker's photographs, it might be inferred that the former is far more sensitive than the latter. If this be the case, then the photographs thus obtained would furnish more precise means for measuring the duration of the illumination, and hence of the flash itself, than the method followed by Wheatstone and others.

The lightning flash contains so large a percentage of the blue rays of light, that we may fairly suppose that its actinic effects on a photographic plate would be more decided than with equally bright sunlight. This greater sensitiveness of the light of a lightning flash may perhaps account in some degree for the possibility of taking photographic pictures by its means, but it also equally explains the probability of the blurred foliage in Mr. Barker's views being actually due to their movement during the short time they were exposed to the camera, and thus disproves the approximate instaneousness of the flash itself.

Central High School,
Phila., Nov. 20, 1885.

Résumé of the Work of the International Geological Congress, held at Berlin, Sept. 28 to Oct. 3, 1885. By Dr. Persifor Frazer.

(*Read before the American Philosophical Society, November 20, 1885.*)

An abstract of the Proceedings of the late Geological Congress at Berlin has been published by the writer in *Science;* a fuller report is about to appear in the *American Journal of Science and Arts.* The report, containing all the documents relating to the work of the Congress, and only less complete than the official report, will be presented to the American committee whenever it meets. In the meantime, it will interest Geologists

to know at once, in a general way, what has been done, and also to learn of certain works which the Congress recommended and patronized, but did not undertake.

The map of Europe, colored geologically, will be issued in 49 sheets ; or 7 high and 7 broad. Each sheet will be 48 centimetres high and 53 cm. broad. The whole map will form a rectangle of 3.36 by 3.71 metres. Prof. Kiepert, of Berlin, is charged with the duty of making a topographical base from the very latest data. D. Reimer and Co. are the publishers. 900 copies are guaranteed by the Congress at 100 francs per copy, of which each of the great States of Europe, to wit : Great Britain, France, Germany, Austro-Hungary, Scandinavia, Italy, Spain and Russia is entitled to 100 copies. The remaining 100 copies are to be divided between the six small States, Belgium, Holland, Denmark, Switzerland, Portugal and Roumania. The other purchasers are to pay 125 francs a copy to the publishers. The scale of the map is to be 1 : 1500 000. A committee is charged with the duty of receiving the colored maps sent in by each country, and of harmonizing them so that they will make a connected whole. This committee consists of Messrs. Beyrich, Hauchecorne, Daubrée, Giordano, Möller, Mojsisovics, Topley and Renevier. But the Committee of Direction, which will really superintend this work, is composed of the first two named, who are on the ground and can better look after the publishing. It was proposed by the committee having in charge the adoption of a uniform system of coloration, that a greenish-gray tint be adopted for the Silurian (Cambrian included). This was warmly opposed and finally the section was altered so as to give the committee the discretion to adopt some *provisional* means of distinguishing the series at the base of the Paleozoic column, with the understanding that it should not in any way prejudice the final scientific decision of these questions. The divisions to be made of the Cambrian and Silurian combined will therefore be threefold, and the three divisions will be different shades of greenish-gray. After the color questions were thus disposed of, M. Dewalque began the more radical questions of the actual divisions themselves. The measures below the Paleozoic column are to be called Archæan, and each geologist is to be left free to distinguish their separate divisions by petrographic characters, without as yet attempting to correlate them in different countries. M. de Lapparent did a notable service to science here by proposing that the term "Protogine" which was based upon no important or necessary characteristic, be once for all abolished. This motion was unanimously carried. The Silurian-Cambrian question again coming up, it was decided to leave the debate on the proper coördination of the series till the meeting in England, three years hence. In the meantime, the committee on the map was permitted to make the divisions as well as it could, but to give no names.

It was decided to divide the Devonian into the Rhenan, the Eifelian, and the Famennian. (2). That the Calceola beds should form part of the Eifelian, and that the upper limit of the Devonian should be drawn at

the base of the Carboniferous Limestones, *i. e.*, the system that includes the Psammites of Coudroz and the upper "Old Red." The question of associating the Permian with the Carboniferous provoked the most heated debate. Stur, Blanford, Lapparent, and Newberry spoke in favor of such association; Hughes, Topley, Nikitin and some others, against it. It was finally decided to leave the question as it was. The Triassic was divided into three parts, but without assigning to them any names.

The eruptive rocks were divided according to the scheme of Prof. Lossen, into seven divisions, one of which is "Serpentine." This part of the Congress's work appears not to have received the attention it deserved, as all the petrographers who were consulted by the writer as to the advisability of such a heading of a division, agreed that it was unfortunate. Among these were Profs. Zirkel, Stelzner, and among the other geologists, Profs. Hughes, Hall, and a great many others.

The Congress formerly approved and voted committees to assist two works of the nature of compendiums. The first of these is a Geographical-Geological Dictionary, by D. Juan Vilanova, Piera Professor in the University of Madrid. The committee appointed at the Bologna Congress to assist in this work consisted of MM. Hughes, Mayer-Eymar, Steinmann, Meli, Szabó, and Inostranzeff. M. Vilanova explained that this was merely an attempt of his to make a French-Spanish dictionary of terms, but he hoped that it would be taken up and improved upon by others, and that especially the parallel terms in other languages would be gradually grafted upon it. I should be glad of the assistance of the members of this Society in extending a knowledge of its scope.

The other work which the Congress appointed a committee to foster was Neumayr's Nomenclator Palæontologicus. The names of the members of this committee are MM. Gaudry, Zittel, Neumayr, and Etheridge.

On the Species of Iguaninæ. *By E. D. Cope.*

(*Read before the American Philosophical Society, October 16th, 1885.*)

By Iguaninæ I mean Iguanidæ* without abdominal ribs† or free dermal margins of the digits‡ which have the nostrils on the line of the canthus rostralis and not below it, and which possess the compressed form and other characteristics indicating an arboreal rather than a terrestrial habit of life. With one exception§ these animals are confined to the forest regions of Tropical America, the greater number of species being found in the West Indies and Mexico. A few species, as the *Conolophus subcris-*

* Exclusive of the Anolidæ, which I have shown to differ in the structure of the lower jaw. Proceedings Academy, Phila., 1864.

† Those with abdominal ribs are the Polychrinæ.

‡ The Basiliscinæ are characterized by the digital margins.

§ The *Brachylophus fasciatus* of the Fejee Islands.

tatus, are entirely terrestrial in their habits. The genera are distinguished as follows:

I. Premaxillary and symphyseal teeth conical.

a Posterior digits with separate combs.

Tail with much of its length free from spines; a gular fold, *Cyclura* Harl.

aa No separate combs on posterior digits.

Tail with the basal half spinous; a throat fold..... *Ctenosaura* Wieg.

Tail short, spinous to the end; a throat fold..... *Cachryx* Cope.

Tail not spinous; a throat fold..... *Brachylophus* Cuv.

Tail not spinous; a dewlap which has a crest of spines on its anterior edge..... *Iguana* Laur.

II. Premaxillary and symphyseal teeth trilobate; no combs on the posterior digits.

A throat fold; tail not spinous..... *Conolophus* Fitz.

No throat fold; tail not spinous..... *Amblyrhynchus* Bell.

CYCLURA Harlan.

Journal Academy Natl. Sciences, i, p. 242, 1825. Dum. Bibr., Erp. Gen., iv, 214, 1837. *Metopocerus* Wagl., Natürl. Syst. d. Amphibien, p. 147, 1830. Dum. Bibr., Erp. Gen., iv, p. 210, 1837. ? *Aloponotus* Dum. Bibr., Erpet. Générale, iv, p. 189, 1837.

The species of this genus known to me are the following:

I. Scales of muzzle all small; combs on third toe only.

Several rows of infralabial scuta; five scales on canthus rostralis; crest interrupted at rump only..... *C. carinata* Harl.

II. Large scuta on muzzle; combs on third toe only; one row of large infralabials.

Infralabials and other scuta in contact with each other and with labials; two scales on canthus rostralis; crest low, much interrupted at nape and rump; color uniform..... *C. bæolopha* Cope.

Infralabial and other scuta separated from each other and from labials by small scales; four scales on canthus rostralis; green, with bands.... *C. nubila* Gray.

III. Large scuta on muzzle; one on middle line protuberant; combs on second and third toes; several rows of large infralabials.

Scales very irregular, often minutely granular on scapular regions; a trace of whorls on tail; crest interrupted at nape and rump; black.. *C. cornuta* Daud.

The reputed species *Cyclura macleayi* Gray, from Cuba, and *C. lophoma* Gosse, from Jamaica, are unknown to me by autopsy.

CYCLURA CARINATA Harlan, Jour. Academy Philadelphia, iv, p. 250, 1825, pl. 15. Cope, Proceeds. American Philosoph. Society, 1870, 558; American Naturalist, 1885, 1006.

Turk's island, Bahamas; *Harlan, Ebell.*

CYCLURA BÆOLOPHA Cope. Proceeds. Academy Philadelphia, 1861, p. 123; American Naturalist, 1885, 1006.
Andros island, Bahamas; *Wood.*

CYCLURA NUBILA "Shaw." Gray in Griffith's Animal Kingdom, ix, 39 fig. Cope, American Naturalist, 1885, p. 1006. *Lacerta nubila* Shaw, (teste Gray) Zoology. *Iguana cyclura* Cuv. *Cyclura harlani* Cocteau, Hist. S. l'Isle Cuba par de la Sagra Rep., p. 96. *C. carinata* Wiegm., Herpet. Mexicana, not of Harlan.
Cuba.

CYCLURA CORNUTA Dand. *Iguana cornuta* Daudin, Rept., p. 382. Latreille Hist. Nat. Rept., ii, 267, iv, 294. *Metopocerus cornutus* Wagler, Nat. Syst. d. Amphibien, 1830, p. 147. Wiegmann, Herp. Mex., 1834, i, p. 16. Dum. Bibr., Erp. Gen., iv, 211, 1837. Günther, Trans. Zool. Soc., London, 1882, p. 218, Pls. xliii, xliv. Boulenger Cat., Brit. Mus., ii, 1885, p. 188. *Cyclura nigerrima* Cope, American Naturalist, 1885, p. 1006. *C. onchiopsis* Cope, loc. cit.

This species has been until recently but little known, although its name frequently appears in literature. The characters ascribed to it by Duméril and Bibron do not agree with those of any individuals which have come under my notice. These authors distinguish the genus Metopoceros from Cyclura by the presence of two rows of femoral pores, a character which does not exist in either of the four specimens in the National Museum. The genus Aloponotus of the same authors possesses, according to them, the same peculiarity. M. Boulenger, in the last (1885) edition of the British Museum Catalogue, describes this character as though it only occurs "sometimes" in this species, evidently regarding it as inconstant. My confidence in its constancy leads me to describe as new two forms, which perhaps belong to the *C. cornuta*, under the names *C. nigerrima* and *C. onchiopsis*. These differ from each other very much as the genera Metopocerus and Aloponotus are said by Duméril and Bibron to differ from each other, *i. e.*, in the character of the scutellation. In the *C. nigerrima* the scales are distinct everywhere; in the *C. onchiopsis* they are minutely granular on the sides of the back and on the nape and withers. In a third specimen (in alcohol, No. 9977), the characters are intermediate. Thus, in the type of *C. onchiopsis*, the masseteric protuberances have larger scales set in a general surface of granulations; in the third specimen, the same surface is nowhere granular, but is scutellate. The anterior dorsal region is less granular in this specimen. I therefore think it necessary to unite my supposed species, as has been done by M. Boulenger.

If the presence of the second row of femoral pores is not constant in the *C. cornuta*, then the genus Metopocerus cannot be distinguished from Cyclura. M. Boulenger relies on the rather greater number of denticles in the lateral teeth in the *C. cornuta*, but my specimens show a tendency

to the tridentate form of the *C. nubila*. The character is, I think, even if constant, insufficient for generic distinction.

I describe the two specimens which represent the extreme of variation of this species, commencing with the type of *C. nigerrima*.

In this specimen the scales of the superior regions are smaller than those of the inferior regions, and are in regular transverse rows, each scale surrounded with granules. There are three rows in two millimeters. The scales of the inferior surfaces are about a millimeter in diameter; like those of the back they have faint traces of keels. The scales of the limbs and tail are keeled. At intervals of about six scales, there are, on the median portions of the sides of the tail, two rows of scales a little larger than the others, which are homologous with those which form the spiny whorls in other species. The crest is rather low on the nape, and is well developed on the dorsal region and anterior part of the tail. On the latter it becomes lower, forming serrate teeth, which are distinguishable to the end of that organ. The crest is interrupted at both withers and rump. Besides the combs on the second and third digits, there is a rudiment of a comb at the base of the first digit. Femoral pores 14–16.

The type specimen of this species was partially skeletonized before it was suspected to be other than a *Metopocerus cornutus*. The plates and scales of the head cannot therefore be described excepting so far as to state that there is a median large scale at the middle of the base of the snout, on an elevation of the nasal bones just behind the transverse line connecting the posterior borders of the bony nares. Between this plate and the canthus rostralis the horizontal surface of the muzzle is covered with rather large antero-posteriorly oval scales, which have a median keel. In the center of these is a larger plate, several times as large as any of them. The scales on the post-frontal region are similar and those of the zygomatic arch posteriorly are larger.

Measurements.	M.
Length of skull to end of quadrate bone	.108
Width of skull at front of tympanum	.070
Least interorbital width of skull	.018
Length of alveolar edge of maxillary bone	.050
" " body to vent	.340
" " tail	.500
" " humerus	.060
" " fore arm	.057
" " femur	.075
" " tibia	.063
" " foot	.110

The color is everywhere uniform black.

From Navassa island. National Museum, No. 9974.

In a second specimen, the type of *Cyclura onchiopsis*, the scales of the

inferior surfaces are similar in every respect to those of the one described above, while those of the sides, tail, and superior surfaces are quite different. Those of the tail are flat and keeled, and smaller than those of that species, and of equal size. In the scutellation of the back the granular scales are far more numerous, covering almost the whole of the scapular regions and sides of the neck and body. Where the larger scales appear they are round and not arranged in rows, and are separated by granular interspaces as wide as or wider than themselves. On the temporal and lateral gular regions the larger scales are scattered at wide intervals in the granular surface. On the muzzle there are two pairs of scuta behind the nasal plates, which are separated by a granular interval. Behind these, and separated by another interval, is a knob-like median scutum. Between this and the canthus rostralis, but separated from it by a wide granular space, are several scales like the smaller ones in the same position in the *C. nigerrima*. There are three rows of small prominent scales over the eye, forming a rough surface. A series of larger scuta on the zygomatic arch, as far as below the front of the orbit. Two prominent scuta not in contact on the anterior border of the tympanum. Two large and two small rows of infralabial plates. Labials $\frac{8}{8}$. Symphyseal plate large, angulate behind. A longitudinal median gular fold, which terminates in a pendulous transverse gular fold. The scales on these folds are like those of the belly, and not granular like those of the lateral gular region. Femoral pores 18. Tail compressed. Dorsal crest low, interrupted at the withers and groin.

Color, dark brown; belly, breast, fore limbs and sides of head black.

Measurements.	M.
Length of head to end of os quadratum	.102
Width of head at front of tympanum	.055
Length of body to vent	.290
" " tail (tip wanting)	.370
" " fore leg	.140
" " humerus (measured behind)	.050
" " forearm	.057
" " hind leg	.200
" " femur (measured above)	.058
" " tibia	.065
" " hind foot	.095

There are three specimens of this species in the National Museum which agree in all essential respects. They are from the Island of Navassa. In all of them the temporal and pterygoid muscles are enormously developed, forming swollen enlargements unlike anything seen in any other Iguanid.

According to Duméril and Bibron there are in the *Metopocerus cornutus* three pairs of scuta on the muzzle. According to the description of these authors this animal also differs from the *M. cornutus* in having eight supe-

rior labials; in the nasals being subround instead of triangular; in having a large instead a small symphyseal plate. The specimen typical of *C. orchiopsis* has a very low and even imperfect dorsal crest, with a wide interruption between the shoulders, while in the other two it is better developed, and in the type of *C. nigerrima* best of all.

CTENOSAURA Wiegmann.

Isis von Oken, 1828, p. 371. *Enyaliosaurus* Gray. Catal. Lizards, Brit. Mus., 1845, p. 192.

The species of this genus are restricted to the Mexican and Central American regions as Cyclura is to the West Indian. The species known to me are six in number, as follows:

I. Caudal whorls complete; dorsal crest extending only on the anterior dorsal region.

Tail round, whorls separated by one row of scales; brown with a few black cross-bands on anterior dorsal region..... *C. hemilopha*

II. Caudal whorls complete; dorsal crest extending to rump.

a Caudal whorls separated by one row of scales.

Three scales on canthus rostralis; dorsal crest interrupted at rump; black or dark brown..... *C. multispinis.*

aa Caudal whorls separated by two or three rows of scales.

Head short, obtuse; three scales on canthus rostralis; dorsal crest interrupted at rump; black with yellow cross-bands; sides of neck yellow..... *C. brevirostris.*

Head wedge shaped; three or four scales on canthus rostralis; all, except the posterior one, deeper than long; dorsal crest interrupted at rump; black, with yellow and green cross bands and speckles..... *C. teres.*

Four canthal scales, the posterior longer than deep; head elongate, wedge-shaped; dorsal and caudal crests continuous at rump; tail compressed; green with narrow black cross-bands to belly.. *C. completa.*

III. Caudal whorls interrupted; each represented by a median dorsal spine and two on each side at the base.

Tail depressed, shorter; dorsal crest widely interrupted at rump; pale brown with black cross-bands on anterior dorsal region..... *O. quinquecarinata.*

CTENOSAURA HEMILOPHA Cope, Proceedings Philadelphia Academy, 1863, p. 105. *Ctenosaura acanthura* Bocourt, Miss. Scient. Mexique Rept. p. 138. *Cyclura acanthura* pars, Dum. Bibr., Erp. Gen. iv., p. 224.

This species is regarded by DeBlainville and Bocourt as the *Lacerta acanthura* of Shaw.* This cannot be correct, as Shaw distinctly states that the dorsal crest of his species extends to the rump. It is probably one of the species of the next section of the genus (II), but which one I am unable to ascertain.

Lower California only; *Botta; Xantus.*

* Zoology iii.

CTENOSAURA MULTISPINIS sp. nov.

Head elongate, flat above, muzzle narrowed; nostril in the second third of the length to the orbit. Three scales on canthus rostralis, each deeper than long. Seven flat scales across muzzle between anterior angles of orbits. Two rows between supraorbital series. Scales above temporal muscles rather large, weakly keeled. Five series of infralabial plates, not separated by smaller ones. Dorsal crest rather elevated in adult, terminating at the rump. Median caudal crest composed of conical scales, commencing above the posterior margin of the femora. Tail cylindrical at base, covered by whorls of prominent scales with conical points which project strongly, and which are separated by one row of smaller flat scales on the upper half of the tail. On the inferior side of the tail the whorl rows are separated by two intervening rows, which are just like them, having a keel and a mucronate apex. Beyond the middle of the length (end lost) the tail is strongly compressed, but whether this is due to shriveling on drying, I am not sure. Median series of spinous scales uninterrupted. The abdominal scales are larger than the dorsal, which are longer than the lateral scales; all are subquadrate, and none are keeled.

Seven femoral pores.

Color above and below, black.

Measurements.	M.
Length from end of muzzle to vent.	.255
" to line of axilla	.125
" " line of auricular meatus	.062
Width of head at auricular meatus	.042
" " " above " "	.035
Length of anterior limb	.093
" " " foot	.037
" " posterior limb	.150
" " " foot	.076

I have before me two stuffed specimens of this species, a large one and probably adult, and a smaller and younger one. The former, which I described above, is No. 201 of Sumichrast's collection, and was procured by him at Dondomingvillo, in the State of Oaxaca, and sent to the Smithsonian Institution. The other specimen was obtained near Batopilas, Chihuahua, by Mr. Edward Wilkinson, and was recorded by me as *Cyclura acanthura* in the catalogue of his collection, Proceedings American Philosophical Society, 1879, p. 261. It agrees with the type specimen in having the distal two-thirds of the tail strongly compressed. The dorsal crest is much less elevated, probably owing to its younger age. The colors are paler, the prevailing tint being light brown with indistinct darker brown cross-bands.

I find a specimen of this species enumerated as var. B. of *Ctenosaura acanthura* by Boulenger in the vol. ii of the Catalogue of the Lizards in the British Museum, p. 197, which has just reached me.

CTENOSAURA BREVIROSTRIS, sp. nov.

Head short, with obtuse muzzle with decurved profile. Eyes large; nostril near end of muzzle, in the anterior third of distance between end of muzzle and orbit. The scales of the top of the muzzle and of the frontal region, are subquadrate or subhexagonal, and those of the temporal regions are but little longer than wide. All are more or less convex, the temporals most so. There are six rows of scales between the nasal plates, some of which are wider than long. Three canthal scales, of which the anterior is horizontally divided in one specimen. Four rows of wide loreal scales above four rows of narrow scales above the supralabials. Labials 13. Infralabials graduating in size to gulars, but there are five rows of subcarinate scales distinctly larger. Two rows between the subquadrate supraorbitals. Scales of lateral temporal region convex. Scales of belly larger than those of back and sides, which are equal, except those of the axillar, scapular and lateral cervical regions which are nearly granular. Dorsal crest very low, continuous, excepting for a short distance at the base of the tail. Tail nearly cylindric. The scales of the median superior crest are not more prominent than those of the sides of the tail, but they are not interrupted as are the latter. For the terminal three-fifths of the length, the scales of the tail (except below) are equally spinous. For the basal third they are separated above by two rows of non-spinous scales, and on the lower parts of the sides by three rows.

In both the specimens the femoral pores are exceedingly small and indistinct and are five in number on each thigh. The throat is distinctly cross-folded, but very indistinctly longitudinally folded on the middle line. The sides of the neck have two longitudinal folds.

The general color of the head and body is a blackish-brown, paler below. This is crossed on the back between the sacral and postscapular regions by five yellow marks, which are bands posteriorly, but become spots anteriorly. The sides of the neck are of the same color, contrasting strongly with the black of the throat and nape. This yellow space is partially divided by a black line, which extends posteriorly from the angle of the lower jaw. The limbs are blackish, and on the fore arm are numerous yellow scales, and the tibia is faintly cross-banded. The digits and the tail are annulated with blackish brown and yellow rings of about equal width.

Measurements.	M.
Total length to end of tail (end of latter imperfect)	.645
Length from muzzle to vent	.242
" " " " line of axilla	.097
" " " " " " meatus of ear	.045
Width at front of auditory meatus	.040
Length (axial) from orbit to end of muzzle	.022
" of fore leg	.096
" " fore foot	.047

Measurements.	M.
Length of posterior leg	.162
" " posterior foot	.085
" " tibia	.045

Two specimens of this species are in the National Museum, which were sent from Colima, in Western Mexico, by John Xantus.

CTENOSAURA TERES Harlan, Bocourt, Miss. Sci. Mexique, Reptiles, p. 142 *Cyclura teres* Harlan, Journ. Acad. Philada., iv, 1825, p. 246, tab. 16 Wiegmann, Herpert. Mex., 1834, p. 42. "*Ctenosaura armata* Gray Synopsis Griff. Anim. Kingdom, ix, 1831," Bocourt. *Cyclura pectinata* Weigmann, Herpetol. Mexicana, 1834, p. 42, tab. 2. Dum. Bibron, Erp. Gen., iv, 1837, p. 221. *Cyclura acanthura* Sumichrast, Univ. et Revue Suisse; Archiv. des Sciences Phys. et Nat., 1864, p. 49. *Ctenosaura pectinata* Wiegm., Gray Catal. Lizards, Brit. Mus., 1845, p. 49. Bocourt, Miss. Scientifique Mexique, Reptiles, p. 140.

Tehuantepec, *Sumichrast;* Colima, *Xantus;* Tampico, *Dallas;* Vega de Alatorre, Vera Cruz, *Comision Geografica.*

Subspecies BRACHYLOPHA Cope.

Four stuffed specimens from Mazatlan differ from others of equal size and age from other localities in the extreme shortness of the processes which compose the dorsal crest. They are in fact merely elongated compressed scales, longer than high, except on the interscapular region, where they are as high as long. The same character is seen in young specimens of the ordinary variety. There are three scales on the canthus rostralis, of which the posterior is longer than deep, the second deeper than long, and the third, adjacent to the nares, is deeper than long, and divided into a superior and an inferior plate. The color is apparently green in life, punctulated with blackish brown. The punctulations arrange themselves into a row of median dorsal spots, and in three of the specimens into two transverse bands near the middle of the sides of the abdomen. Tail with broad blackish rings. The measurements of the largest specimen are: Total length, 630 mm; to vent, 263 mm; to posterior border of membranum tympani, 59 mm; width of head at front of mem. tympani 40 mm; length of posterior leg and foot, 124 mm; of posterior foot 52 mm.

Mazatlan *Bischoff;* Nos. Natl. Museum, 7180–81–82–83.

CTENOSAURA COMPLETA Bocourt, Miss. Scientif. Mexique, Reptiles, p. 145. *Ctenosaura pectinata* Cope, Proceedings Academy Philada., 1866, p. 124; Proceedings Amer. Philos. Soc., 1855, p. 388.

Aspinwall, Panama, *Gill;* Guatemala, San Salvador, *Miss. Scientif.;* Yucatan, *Schott;* Cozumel Id., *Ridgway.*

CTENOSAURA QUINQUECARINATA Gray. Cope, Proceedings Amer. Philosophical Society, 1869, 161. *Cyclura quinquecarinata* Gray, Zoological Miscellany, p. 59. *Enyaliosaurus quinquecarinatus* Gray, Catal. Lizards, Brit. Mus., 1845, p. 192.

Tehuantepec, *Sumichrast.*

CACHRYX Cope.

Proceedings Academy Philada., 1866, p. 124.

This genus is of the type of Ctenosaura, differing only in the characters of its tail. It lacks the terminal portion which is in that and other genera free from spinous scales. It is not in my opinion allied to Urocentrum or Hoplocercus as suggested by Bocourt, genera which belong to the terrestrial division of the family, or Humivagæ.

CACHRYX DEFENSOR Cope. Proceeds. Acad. Phila., 1866, p. 124. Proceeds. Amer. Philos. Soc., 1869, p. 169, pl. 10. Bocourt, Miss. Sci. Mexique, Reptiles, p. 148, pl. xvii. bis. figs. 12, 12a.

Yucatan, *Schott.*

BRACHYLOPHUS Cuvier.

Regne Animal, edit. ii, p. 41. Duméril Bibron, Erp. Gen., iv, p. 225. Gray, Catal. Brit. Mus., 1845, 187. Fitzinger Systema Reptilium, 1843, p. 55. *Chloroscartes* Günther, Proc. Zoöl. Soc. London, 1862.

BRACHYLOPHUS FASCIATUS Brong. Cuv. Regne Animal, ii edit., p. 41. Dum. Bibron, Erp. Gen., iv, 1837, p. 226. Gray, Catal. Liz. B. M., 187. *Chloroscartes fasciatus* Günther, Proceeds. Zool. Soc. London, 1862, pl. xxv.

Feejee Is.

IGUANA Laurenti.

Specimen Synopsis Reptilium, 1768, p. 47. Duméril Bibron., Erp. Gen., iv, 1837, p. 199. Gray, Catal. Brit. Mus., 1845, p. 186. *Hypsilophus* Wagler, Nat. Syst. Amphib., 1830, p. 147. *Amblyrhynchus* "Bell" Wagl., l. c., p. 148 (nec Bellii.).

IGUANA TUBERCULATA Laurenti.

Subspecies TUBERCULATA Laurenti, l. c., p. 49. Dum. Bibr., Erp. Gen., iv, p. 203; Gray, Catal. Liz. Brit. Mus., 1845, p. 186.

South America, east of the Andes; Lesser Antilles.

Subspecies RHINOLOPHA Wiegm. *Iguana rhinolopha* Wiegmann, Herpetol. Mexicana, 1834, i, p. 44. Dum. Bibr., Erpet. Gen., iv, p. 207. *Iguana tuberculata* var. Wiegmann, Isis, 1828, p. 364; Cope, Proceeds. Amer. Philosoph. Society, 1869, p. 161.

Costa Rica, *Gabb;* Tehuantepec, *Sumichrast;* Colima, *Xantus;* Cozumel, Yucatan, *Ridgway.*

Tierra Caliente of Mexico.

IGUANA DELICATISSIMA Laurenti. Specimen Syn. Reptilium, p. 48, 1768. Gray, Catal. Brit. Mus., 1845, p. 187. *I. nudicollis* Cuv., Regne Animal, ii, p. 40. Dum. Bibr., Erp. Gen., 1837, iv, p. 208.

Guadalupe, Nevis, *Ober.*

CONOLOPHUS Fitzinger.

Systema Reptilium, 1843, p. 55. Boulenger, Catal. Lizards, Brit. Mus., 1885, ii, p. 186. *Amblyrhynchus* pars Dum. Bibr., iv, p. 197. *Trachycephalus* Gray, Catal. Liz. Brit. Mus., 1845, p. 188.

M. Boulenger (Catalogue Lizards Brit. Museum, 1885) first pointed out the characters which distinguish this genus from Brachylophus.

CONOLOPHUS SUBCRISTATUS Gray. *Amblyrhynchus subcristatus* Gray, Zool. Misc., p. 6, 1831. Zoology Beechy's Voyage Rept., p. 93, 1839. *Amblyrhynchus demarlii* Dum. Bibr., Erp. Gen., iv, p. 197, 1837; Bell Zool. Beagle, iii, p. 22, 1843, pl. ii. *Conolophus demarlii* Fitz., Syst. Rept. *Conolophus subcristatus* Steindachner, Festschr. K. K. Zool. Bot. Gess. Wien; Die Schl. u. Eid. d. Galapagos Ins. 22, 1876, tab. iv, v, figs. 6–9; vi, figs. 4–6; vii, 5–8. *Trachyphalus subcristatus* Gray, Cat. Liz. Brit. Mus., 1845, p. 188.

Galapagos Ids.

AMBLYRHYNCHUS Bell.

Zoological Journal, London, 1825, p. 195. Dum. Bibr., Erp. Gen., iv, 204 pars. *Oreocephalus* Gray, Catal. Liz., Brit. Mus., 1845, p. 189.

Steindachner states that the *Amblyrhynchus cristatus* possesses no gular cross-fold. I know of no other ground for separating it generically from the *Conolophus subcristatus*.

AMBLYRHYNCHUS CRISTATUS Bell, loc cit. Tab. xii. Do. Voyage of the Beagle, iii, p. 23. Steindnachner Festschrift der K. K. Zoolog. Botan. Gess., Wien, 1876; Die Schlangen u. Eidechsen der Galapagos Ins., p. 16, tab. iii, v, vi, figs. 1–4. *Hypsilophus cristatus* Fitzinger. *Amblyrhynchus ater* Gray. Synops. Rept. Griff. Anim. Kingdom, ix, p. 37. Dum. Bibr., Erp. Gen., iv, p. 196. *Oreocephalus cristatus* Gray. Catal. Brit. Mus., 189.

Galapagos Ids.

Thirteenth Contribution to the Herpetology of Tropical America. By E. D. Cope.

(Read before the American Philosophical Society, Nov. 20, 1885.)

I. NICARAGUA, Bransford.

Dr. J. F. Bransford, U. S. N., has sent from time to time collections from Central America to our scientific institutions, which have thrown much light on the zoölogy of the regions he has visited. In 1874, I had the privilege of publishing a report on a collection obtained by him in Nicaragua*; and later (1875) I published an account† of a collection sent

* Proceedings Academy Philada., 1874, p. 64.
† Journal Academy Philada., 1875, p. 155.

by him from Panama. On these occasions I defined six species not previously known to science. On the present occasion I am able to determine the contents of a new collection obtained by Dr. Bransford in Nicaragua. This embraces thirty species, of which ten are new to science. The collection adds very much to our knowledge of the range of various species, both as to their southward and northward extension. The specimens are the property of the National Museum at Washington, which institution placed them in my hands for identification and description.

BATRACHIA.

ANURA.

1. BUFO HAEMATITICUS Cope, Nos. 14178, 14181. Abundant.
2. BUFO MARINUS L., Nos. 14198, 14213. One specimen.
3. BUFO VALLICEPS Wiegm., Nos. 14194–5–88. Three specimens.
4. DENDROBATES TINCTORIUS Ichn., No. 14183. Abundant.
5. DENDROBATES TYPOGRAPHUS Keferst. No. 14189. Abundant.
6. ENGYSTOMA PICTIVENTRE, sp. nov.

One small metatarsal tubercle. Muzzle anterior to eye equal to twice long diameter of latter, and projecting well beyond the mouth. Nostrils lateral-terminal. No fold across occiput. Skin everywhere smooth. First finger shorter than second, which reaches end of muzzle when the limb is extended. When the hind limb is extended forwards, the distal end of the astragalus reaches the extremity of the muzzle. First toe very short; second a good deal longer than fifth; fourth elongate.

Color above olivaceous brown. A black band with a very narrow pale superior border extends from the end of the muzzle to the lower part of the groin, the superior border descending posteriorly. No inguinal spot. Below black, with white spots. Those on the abdomen are very large; those on the femora and tibia are smaller, and those on the thorax and gular region are still smaller.

Total length of head and body, 22.5 mm.; of posterior leg, commencing at groin, 29 mm.; length of posterior foot, 14 mm., of which the astragalar portion measures 4.5 mm.

No. 14196; National Museum.

7. HYPSIBOAS MILIARIUS, sp. nov.

A species above medium size, in which the pollex is free from the index for most of its length, and terminates in a flattened cone, instead of a curved, acute spine.

Vomerine teeth in two transverse series behind the posterior borders of the choanæ, and within the lines of their internal borders. Ostea pharyngea half the size of the choanæ. Tongue subround, feebly emarginate posteriorly. Eyes large and prominent. Head flat and depressed, wider than long, muzzle broadly rounded and with perpendicular profile; and as long as the orbit's diameter. Canthus rostralis almost wanting, very

concave. Nostrils terminal and lateral. Tympanum three-fifths diameter of orbit, larger than digital discs. Both anterior and posterior feet palmate to the bases of the last phalanges of the longest digits, except between the second and third anterior digits, which is only palmate to the bases of the penultimate digits. When the hind leg is extended the heel reaches the end of the muzzle. The posterior digits are short, but two phalanges projecting beyond the knee when the leg is closed. The palmation is wide, and extends a short distance between the external metatarsals. A well-marked cuneiform tubercle, with slightly free apex.

The under surfaces have the usual areolation. The superior surfaces are thickly covered with small tubercles, which are largest and most prominent on the top of the head, where some of them are subspinous. There is a serrate narrow free dermal margin on the external edge of the fore leg, from the elbow to the end of the fifth digit, and a similar one on the external edge of the posterior foot. There is none on the side of the body.

Length of head and body M. .062; length of head on middle line to line connecting posterior extremities of maxillary bones, .017; width of head at same point, .025; length of anterior limb from axilla, .035; do. of fore-arm, .011; length of carpus and digit, .019. Length of thigh from groin, .025; of tibia, .032; of tarsus, .019; of foot to end of fourth digit, .025.

The color of all the upper surfaces is a dark plum or mulberry, with an obscure coarse reticulation of a darker shade. The color of the inferior surfaces everywhere is yellowish, spotted with the color of the dorsal region. At each heel, and just below the vent, there is a yellow spot. The webs of both fore and hinder feet are plum-color, except the borders, which are yellowish. The digits are yellowish on the under sides. There is a spot of pale color on the upper lip below the space between the orbit and the tympanum, and some less distinct spots on the lip anterior to it. The dermal processes of the fore-arm and tarsus are light yellowish.

Collection No. 14193.

This fine species approaches nearer in coloration, dermal character, and form of palmation to the *Hyla marmorata* than to any other species of that genus. The remarkable development of the pollex, however, places it in the genus Hypsiboas, although it differs materially in the details of this part from the known species of the genus.

8. Hypsiboas albomarginatus Spix. Nos. 14190–91–92. One of the three specimens has a yellow dorsolateral band on each side.

9. Hyla quinquevittata, sp. nov.

Rather small. External fingers with a slight rudiment of a web at their bases. Toes with web only reaching the middle of the penultimate phalanges of the third and fifth digits. Vomerine teeth in two rather large rounded fasciculi close together on the anterior half of the space between the choanæ. Tongue a little longer than wide, feebly notched. Tympanic membrane round, two-fifths the long diameter of the eye-fissure. The

muzzle is rather acuminate and projects beyond the mouth. The canthus rostralis is distinct and concave. The skin is perfectly smooth on all the superior surfaces. The wrist of the extended fore limb extends to the end of the muzzle; while the heel extends a little beyond the same point.

Length of head and body M. .029; of fore-leg, .017; of hind leg, .043; of hind foot, .019; of tarsus, .009; of tibia, .015.

Color above light gray, with five parallel dark-gray longitudinal bands. The median band is somewhat indistinct posterior to the interscapular region and in front of the sacrum. Anteriorly it expands so as to form a large subtriangular spot between the eyes, the apex being posterior. The femur has one cross-band; the cubitus two, and the tibia three. Inferior and concealed surfaces unspotted.

Coll. No. 14187.

This species is, in many technical respects, similar to the *Hyla eximia* Baird. The hinder legs are much longer; the muzzle is more acuminate, and the color bands are much wider. The frog is probably of a different color in life.

10. AGALYCHNIS HELENÆ Cope. Proceeds. Amer. Philosoph. Society, 1884, p. 182.

A larger specimen than the type, in which yellow border of the lateral purple stripe, and the bars which cross it, are wider. There are also traces of pale cross-bands on the back. No. 14186.

11. LITHODYTES DIASTEMA Cope. One specimen; No. 14209.

12. LITHODYTES BRANSFORDII, sp. nov.

Represented by a number of individuals of small size, but which are adult. The characters are well marked. The legs are short, the posterior when extended only bringing the heel to the orbit. The vomerine teeth are in two transverse or slightly arched series, near together well behind the line of the posterior nares, and not extending exterior to the middle of the latter. The tympanic disc is large, in four of the specimens equaling the diameter of the eye-fissure, in three others not exceeding two-thirds of that size. The muzzle does not project, and is slightly truncate, and is about equal in length to the diameter of the orbit. The nostril is nearly terminal-lateral. Canthus rostralis distinct, obtuse, nearly straight. The toes are entirely free, and the dilatations are moderate. Two metatarsal tubercles, the inner larger. The skin of the back is thrown into delicate longitudinal parallel folds, which are easily lost.

Length of head and body, M. .0255; length of anterior limb, .013; of posterior limb from groin, .036; of foot, .017; of tarsus, .0075; of tibia, .012.

In the color there is much pink on the upper and concealed surfaces. There are two dark spots on the lip, one below each canthus of the eye. There is a large more or less obsolete spot behind and above the axilla, with an oblique posterior border. There is a dark spot on the parietal region and generally one between the anterior parts of the orbits. There

is generally a light open chevron pointing forwards across the middle of the back, with a dark one in front of it. In the largest specimen a pink band extends from the orbit posteriorly to the ilium. Posterior face of femur brown with light specks or finely brown mottled. Other lower surfaces whitish, except that in a few specimens the gular region is obscurely brown mottled.

This species belongs to the short legged group represented by the *L. diastema*, and need not therefore be compared with the *L. podiciferus*, *muricinus* and *rhodopis*, where the heel reaches much beyond the muzzle. From *L. diastema* it differs in the much longer posterior foot, and in the close approximation of its teeth, which form a row and not a fascicle. The tympanum is at all times much larger and more distinct, although it is variable in diameter.

This species is dedicated to Doctor John F. Bransford, U. S. N., whose researches have thrown much light on the fauna of Nicaragua.

Museum ; No. 14200.

13. LITHODYTES RANOIDES, sp. nov.

This form is a little nearer to some already known than the last described. The heel of the extended hind leg reaches exactly the end of the muzzle, being thus still shorter than in the group above mentioned, which is represented by the *L. rhodopis* and its allies. The vomerine teeth, unlike any of the forms mentioned, are in small fasciculi, which are not widely separated, and which are entirely behind the line of the posterior border of the nares, and within that of the internal border. A distinctive character is the presence of a small web between the toes, which is nearly as well developed as in the *Hylodes* (*Lihyla*) *guentherii* Keferst. The diameter of the tympanic disc is about half that of the ball of the eye. The tongue is a parallelogrammic oval, and is entire posteriorly. The head is relatively rather long, and the muzzle is acuminate. The muzzle projects somewhat beyond the mouth, and beyond the nares, which are above the edge of the symphysis mandibuli. Its length a little exceeds that of the eyeball, which itself is more than half larger than the interorbital width. The canthus rostralis is distinct and nearly straight. The digital dilatations are truncate. The external metatarsal tubercle is obsolete, and the internal one is small. The skin is nearly smooth, but a pair of feeble folds form an obscure pattern on the scapular regions.

Length of head and body, M. .0265 ; do. to line connecting posterior borders of tympana, .10 ; width at anterior borders of do., .0105 ; length of fore limb from axilla, .0155 ; of hind limb from groin, .041 ; of hind foot, .019 ; of tarsus, .0075 ; of tibia, .014.

Color dark ashen above, darker on the head. A pale cross-band across frontoparietal region. Four large dark spots on upper lip, commencing at end of muzzle. Limbs dark cross-banded ; three on tibia and two on femur. Sides and lower surfaces white, the former and the gular and

pectoral regions thickly speckled with dark ash ; a few larger splotches of the same in front of and at the groin. The cross-bands of the tibia extend on the skin that covers the flexors of the foot so as to be seen from below.

Four specimens ; No. 14179.

14. HYLODES POLYPTYCHUS, sp. nov.

Vomerine teeth in two transverse series behind the posterior borders and within the lines of the internal borders of the choanæ. Tympanic disc a vertical oval, the long diameter two-thirds that of the orbit. Limbs short, the heel only reaching the muzzle. The toes are rather long, have rather small oval dilatations and are perfectly free at the base. The head is short, and the muzzle has an oval outline, and projects a little beyond the mouth. Its length anterior to the orbit equals the diameter of the same, and the nostril is nearly terminal. Two distinct metatarsal tubercles, the internal with a rather prominent apex. The tubercles below the bases of the phalanges are rather prominent. The skin of the abdomen is areolate. That of the upper surfaces is plicate and tuberculate. The plicæ are interrupted, and may be regarded as forming eight longitudinal series, the external of which are dorso-lateral. Below these the sides are tubercular ; as are also the spaces between the dorsal plicæ, the superior surfaces of the limbs, and the top of the head, especially the superior face of the eyelids. An external fold on the distal half of the tarsus.

Length of head and body, .027 ; of head to posterior line of tympanum, .009 ; width at anterior line of do., .011. Length of fore limb, .015 ; of hind limb, .037 ; of hind foot, .018 ; of tarsus, .0073 ; of tibia, .012.

Color above dark ashen, with indistinct shades. Four dark spots on upper lip ; a dark shade above and posterior to axilla ; four narrow black cross-bands on thigh, two across tibia and four across external side of foot. Inferior surfaces dirty white. Posterior face of thigh and gular region thickly clouded with brown.

Two specimens ; No. 14199.

15. RANULA CHRYSOPRASINA Cope. Several specimens ; No. 14180.

REPTILIA.

LACERTILIA.

16. AMIVA FESTIVA Licht. et Von M. All of the specimens (four) have but three supraocular scuta. Nos. 14204–5.
17. CORYTHOPHANES CRISTATUS. No. 14202. One specimen.
18. ANOLIS COPEI Boc. No. 14210. One specimen.
19. ANOLIS RODERIGUEZII Boc. Cope, Proceedings Amer. Philos. Soc., 1885, p. 391. Three specimens ; No. 13721.
20. ANOLIS CRASSULUS Cope. One specimen ; No. 14208.
21. ANOLIS CAPITO Peters. Three specimens ; No. 14203–12.
22. ANOLIS OXYLOPHUS Cope. Four specimens ; No. 14211.
23. ANOLIS QUADGULUS Cope. Numerous specimens ; No. 14208. The

coloration of none of these individuals agrees with the type in having the vertical black lines, on the sides which I have described. The dorsal chevrons are frequently present, but they are sometimes replaced by large pale brown rhombs or a uniform metallic pale brown. The keels of the ventral scales are sometimes obsolete. The scales round the occipital are generally keeled, as well as those of the rest of the head.

24. SPHÆRODACTYLUS HOMOLEPIS, sp. nov.

Scales of upper surfaces small, flat, not granular nor keeled, a little smaller than those of the abdomen. Rostral plate large. Labials $\frac{4}{4}$, first inferior labial corresponding to three superior labials. Muzzle a little longer than distance from eye to auricular meatus, and one and two-thirds times the length of the eye's diameter. Scales of lower surface of normal tail similar to those of upper surface.

Brownish cream color with dark brown bands, longitudinal on the head, and transverse on neck, body and tail. There are seven lines on the head, one median, and three on each side. The inferior is short and is anterior to the auricular meatus; the second extends from the end of the muzzle through the eye to the neck, and the third runs backwards from the superciliary region to an equal length. The cross-bands are not so wide as the spaces between them. One is at the nape, one crosses the shoulders, one the middle of the body and one the groin. There are four complete annuli on the tail.

This species is of very small size. Total length M. .024; of head and body, .016; of head to auricular meatus, .004. No. 14207.

This Sphærodactylus is nearest the *S. sputator* of Cuba. In that species the scales are smaller, there are subcaudal scutella, and the head-bands are less numerous and distinct.

25. RHADINÆA DECORATA* Günther. No. 14217.

* A species of this genus in my collection from the State of Hidalgo, Mexico, is apparently undescribed. I call it *Rhadinæa quinquelineata*. It is nearest the *R. tæniata* Peters, but has a much shorter tail, and differs in coloration. The scales are in seventeen longitudinal rows, and as in other species of Rhadinæa, are poreless. There is but one preocular plate, which does not approach the frontal. The loreal is longer than high; postoculars 2; temporals 1-2. Superior labials, eight, all higher than long, excepting the last, which is as high as long; the third, fourth and fifth entering the orbit. Parietal plates elongate, exceeding the frontal. Anterior border of frontal angulate, its length about equal to the lateral border. Inferior labials ten, the pregenials considerably shorter than the postgenials. Gastrosteges 179; anal 1-1; urosteges 77. Total length M. .438; of tail, .115; to canthus oris .011.

Color light brown above; below to ends of gastrosteges, and upper lip, yellow. A black band runs along the middle of the fourth row of scales, and a dusky one on the adjacent halves of the seventh and eighth rows. A narrow black line along the median row. The lateral band extends through the eye to the end of the muzzle, crossing the tops of the 8th, 7th, 6th and 5th labials, becoming darker anteriorly. The band of ground-color above it extends to the eye, narrowing in front. The three dorsal bands unite into a wide brown one on the nape, which spreads out and covers the top of the head. The last two maxillary teeth are much stronger than the others.

Discovered by my friend Dr. Santiago Bernad; two specimens; a third from the State of Pueblo.

26. OPHIBOLUS POLYZONUS MICROPHOLIS COPE. No. 14214.

27. HERPETODRYAS MELAS, sp. nov.

Scales in ten longitudinal series, all smooth, those of the median rows larger than those of the lateral, and rather smaller than the parietal scuta. Parietals rather short and wide, openly emarginate behind. Nine superior labials, all longer than high, the fourth, fifth and sixth entering the orbit. Nasals well developed; loreal square; oculars 1–2; temporals 1–1–1. Muzzle rather short, and eye large; diameter of the latter equal length from orbit to nostril. Frontal not much concave at sides. Inferior labials ten, fifth longest, narrow, and the last one in contact with the genecials. Postgenecials longer than pregenecials. Gastrosteges 158; anal 1–1; urosteges 139. Total length M. 1.210; length of tail, .470; length to rictus oris, .029.

Shining black, except on the superior labial scuta and anterior half of body, which are cream-colored. The ends of the light gastrosteges remain black. Here and there a black scale has a white edge, and several present this character distinctly just posterior to the angle of the mandible on the neck. No. 14219.

This interesting species is nearest to the *Herpetodryas grandisquamis* Peters (Cope, Journal Academy Philada., 1875, p. 135), but differs in having the scales smaller, without keels, and in ten longitudinal rows. Peters placed the latter in Spilotes, but I have not adopted this arrangement, since like the *H. melas*, it has a divided anal plate, and scales without fossæ in an even instead of an odd number. These characters indicate clearly that its place is in Herpetodryas.

28. DENDROPHIDIUM DENDROPHIS* Shl. *Herpetodryas poitei* D. & B.

Two specimens (Nos. 14215–20) adult and half-grown. The latter has the coloration ascribed to this species, while the cross-lines and lateral spots are obsolete in the former. There are no markings on the head and neck of the adult. The top of the head is red in the adult. Oculars

* A species allied to the *D. dendrophis* was sent to the Smithsonian Institution from Guatemala by H. Hague, which has not yet, so far as I am aware, received a place in the system. It may be called *Dendrophidium chloroticum*. The scales are in seventeen rows, of which four rows on each side are smooth on the anterior part of the body, and only two smooth on the posterior. The parietal plates are a little longer than the frontal, which has straight sides. The eye is large, its anteroposterior diameter equaling the width of the superciliary and frontal scuta combined, and equaling the length of the muzzle to the middle of the prenasal plate. Oculars 1-2. Temporals 2-2, all narrow. Superior labials nine, the last three longer than high. Loreal large, higher than long; nasals rather small. Gastrosteges 169; anal 1-1; urosteges, 117. Color above, including ends of gastrosteges, green; below yellow. On stretching the skin it is seen to be black between the scales of the sides of every second or third row, in oblique lines running upwards and forwards. Total length M. 1.048; of tail, .341; to rictus oris .027.

This species is abundantly different from the *D. melanotropis* Cope, but is near to the *D. dendrophis* Schl. The muzzle is shorter than in our specimens of the latter, and in those figured by Jan, and the number of keeled rows of scales is less, nine to fifteen. The color is entirely different.

1-2. Three temporals border the labials above, except on one side of the younger specimen where there are but two, as in the individuals figured by Jan in Iconographic Generale des Ophidiens Livr. 31, Pl. iii. The specimens of the species hitherto described are from Cayenne.

29. HAPSIDOPHRYS SATURATUS Cope. *Leptophis saturatus* Cope, Journal Academy Philada., 1875, p. 133; Pl. 28, fig. 10.

The frontal plate, in the single specimen sent, has its lateral borders straight and not contracted as in the type specimen figured. No. 14216. *Hapsidophrys* Fisch. differs from Leptophis in having a loreal plate, and from Philothamnus Smith, in having keeled scales. Its American species are *H. mexicanus* D. & B.; *H. diplotropis* Gthr. and *H. saturatus* Cope. To Leptophis belong *L. bilineatus* (*Diplotropis* Gthr.), *L. occidentalis* Gthr., *L. sargii* Fisch., and *L. præstans* Cope. To Philothamnus must be referred *P. æruginosus* Cope; *P. modestus* Gthr. and *P. depressirostris* Cope.

30. ELAPS NIGROCINCTUS Gird. No. 14214; one specimen.

31. ELAPS MULTIFASCIATUS Jan. No. 14218; one specimen.

GENERAL REMARKS.

A general analysis of the Herpetological fauna of Nicaragua cannot yet be given, especially as the distribution of species within the State has not been furnished by explorers. It will however be of interest to note the following points:

Of the thirty-one species enumerated in the preceding catalogue four are widely distributed South American forms, viz: *Bufo marinus; Hypsiboas albomarginatus; Dendrobates tinctorius* and *Dendrophidium dendrophis*. Three are especially Mexican forms, although they extend as far south as Costa Rica, viz: *Bufo valliceps; Rhadinæa decorata* and *Ophibolus polyzonus*. The remainder are especially Central American forms, which have been found either in Guatemala, Costa Rica or Panama, or are new to science. Of these the number having a southern range is considerably in excess of those ranging to the north of Nicaragua.

II. PANAMA Nelson.

The following species were obtained at Panama by Dr. George W. Nelson, and sent to the National Museum at Washington. Two of the species are new to science.

BATRACHIA.

1. HERPELE OCHROCEPHALA Cope. Proceedings American Philosoph. Society, 1885, p. 171. *Cæcilia ochrocephala* Cope, Proceedings Academy Philadelphia, 1866, p. 132; Brocchi Mission Scientif. Mexique. One specimen; No. 14116.

OPHIDIA.

2. RHADINÆA FULVICEPS, sp. nov.

Scales in seventeen longitudinal rows. Two preoculars, the inferior

small and occupying a notch between the third and fourth superior labials. Preorbital part of head short. Internasals and prefontals broader than long. Frontals, supraorbitals and occipitals rather large. Rostral plate wider than high, rather prominent. Postnasal higher than prenasal, its posterior border an arc of a circle. Loreal higher than long. Postoculars two, the inferior the smaller. Temporals 1–2–3. Superior labials eight, all longer than high, excepting the sixth, which is as high as long; the fourth and fifth bounding the orbit. Inferior labials nine, fifth largest, and the last one in contact with the genecials. Postgenecials longer than pregenials. Gastrosteges 144; anal 1–1; urosteges 109.

Color above dark brown, with three darker brown longitudinal bands. The lateral one is on the second and third rows of scales, and the median stripe occupies four rows. Below yellow, with a serrate blackish border on each side, due to the presence of an angular spot at the extremity of each two gastrosteges, which covers the suture between them. Top of head yellowish-brown, quite distinct from the body, and without markings. Sides of head darker; lips yellow, each plate with a black border, and more or less numerous black spots. One of these, larger than the rest, extends upwards towards the line of the posterior extremities of the parietal scuta. Another extends a short distance posterior to the angle of the mouth.

Total length, M. .341; of tail, .148; to rictus oris, .007. Collection, No. 14118.

This small species is nearest to the *R. ignita* (Cope, Journal Academy Phila., 1875, p. 140), in technical characters, but the inferior preocular has a different position, and the coloration is entirely distinct. No. 14118.

3. Leptognathus stratissima, sp. nov.

This species belongs to the section of the genus with elongate colubriform genecial scuta, smooth scales, and a larger vertebral series. The scales of the vertebral series are longer than wide, and are truncate at the apex, and do not exceed the other scales so much as is seen in some species. This species differs from most of those of the same section, in having the loreal entirely separated from the orbit by the well-developed preocular.

Scales in seventeen series. Internasal and prefrontal scuta broader than long. Frontal large, wide. Parietals large, loreal as high as long at base. Oculars 1–2, the inferior postocular much smaller than the superior. Superior labials eight, the third, fourth and fifth entering orbit. Temporals 2–3. Inferior labials six, in contact with genecials, the sixth separated by a scale from the postgenecial for most of its length. Gastrosteges, 232; anal, 1–1; urosteges, 130.

Total length, M. .381; of tail, .100; to rictus oris, .008. Coll., No. 14121.

Ground color light gray, which is covered by the following markings: There are sixty-nine cross-bands of a deep brown, which narrow a little on the sides, and have broadly rounded extremities at the second row of

scales. The centres of the spaces between them on the sides are occupied by a light brown spot. Each gastrostege has a dark brown spot on its extremity, and the rest of the scutum is thickly dusted with brown. Thirty-nine cross-bands on upper surface of tail. Three brown chevrons on the parietal region, directed backwards, the anterior commencing with the superciliary. Muzzle and sides of head brown speckled; throat and chin immaculate.

4. DIPSAS CENCHOA L. Nos. 14119–20.

5. DRYMOBIUS BODDAERTII Seetzen. No. 14117.

6. ELAPS NIGROCINCTUS* Girard. No. 14115.

7. BOTHROPS ATROX L. No. 14114.

III. CHIRIQUI.

HYLA MICROCEPHALA, sp. nov.

Fingers free; toes webbed nearly to the palettes of the third and fifth digits. Vomerine teeth in two fascicles between the nares, with their anterior edge in line with the anterior edge of the latter. *Membranum tympani* round, its diameter one-third that of the eye. The latter equals the length of the muzzle, which is short and rather deep, and not prominent. The external nostril is at one-fourth the length posterior to the apex. The head is small in its dimensions, its length to the line of the posterior border of the tympana entering the length of the head and body, three and a half times. The eyes are little prominent. The general form is slender, and the hinder legs are long, the heel reaching to beyond the end of the muzzle. The metatarsal tubercles are not distinguishable as dermal differentiations. Digital dilatations not so large as the tympanic membrane. Skin everywhere smooth on superior surfaces. Length of head and body, .0275; do. of anterior limb from axilla, .014; of posterior

*A species of this genus has been obtained by Francis Sumichrast, on the Pacific side of the Isthmus of Tehuantepec, which I believe to be undescribed. It is referred to in the Proceedings of the American Philosophical Society, 1869, p. 162, as *Elaps aglœope;* but it is distinct from this species. I propose that it be called *Elaps ephippifer*. It has the seven superior labials and fifteen rows of scales of the most of the American Elaps, and the labials are separated from parietals by one row of temporals. The rostral plate is transverse and not particularly prominent, and its posterior border is very openly angulate. The frontal plate has long parallel lateral borders, and much shorter posterior ones. Gastrosteges, 218; anal divided; urosteges, 43. There are seventeen black rings on the body, which encircle the abdomen, covering a length of four and a half scales and five or six gastrosteges. They are separated by nine or ten scales, and have a wide yellow border of one and a half or two scales in width. The entire space between these yellow borders is occupied by a large black spot, which descends on each side to the second row of scales. The remaining space between the yellow borders is red. There is a wide black entire collar, which cuts off the apex of the parietal shields. The muzzle and front are black as far as the anterior part of the parietals.

The wide yellow borders in this species are like those of the *E. euryxanthus*, while the black saddles represent the black spots of the *E. aglœope*.

limb from groin, .0415; do. of posterior foot, .019; of tarsus, .0095; of tibia, .0145. Width of head at anterior border of tympana, .008.

Rich cream-color on all the upper surfaces, on one specimen tinged with brown. Below lighter cream-color. A pale brown band with a narrow yellow superior margin from the end of the muzzle to the groin. The brown tint fades out rapidly below, and on the posterior half of the side is reduced to a narrow line. A narrow brown band on each side of the back, which extend as far forward as the orbit.

This species is well characterized, having little resemblance to any other member of the genus. It was taken along a mountain stream in the department of Chiriqui. Two specimens; No. 13473.

IV. City of Chihuahua, Wilkinson.

Information as to the character of the reptilian fauna of the central part of the State of Chihuahua, has been a desideratum. A few specimens from the region were sent many years ago to the Museum of the Smithsonian Institution by Mr. John Potts, and are recorded in the report of the Mexican Boundary Survey by Professor Baird. A collection from the southern part of the Sierra Madre in this State, from the mining district of Batopilas, was sent me for study by Mr. Wilkinson, and was reported on in the Proceedings of this Society for 1879, p. 261. That region is however much to the south of the one represented by the present collection, and is much more elevated.

The great plain in which the city of Chihuahua stands is arid, and the vegetation is generally sparse. Low mountains bound it on the east and west. The formation of the surface of the plain is a coarse drift composed principally of little or much rounded fragments of basalt, more or less cemented together by a calcareous mud. The same formation composes the plains of Southern New Mexico. The vegetation of this plain consists of mesquit, Fouquieria, Yuccas and Opuntias. South of the city is a considerable tract of grassy country. The city stands on a creek, whose waters are used by the inhabitants for supporting a cultivation which produces a most agreeable contrast to the general aspect of the country.

Mr. Wilkinson's collection indicates that reptiles are numerous, since he obtained, in a short time, 471 individuals. These only represent twenty-six species and subspecies. They are as follows.

Lacertilia.

1. Phrynosoma cornutum Harl. Abundant; Nos. 14228–52–90, 14300.
2. Phrynosoma modestum Gird. Abundant; Nos. 14229–51–91; 14301.
3. Holbrookia texana Trosch. Abundant. Nos. 14234–38–43–47, 14309.
4. Holbrookia maculata B. & G. Abundant. Nos. 14239–40–45, 14310.
5. Crotaphytus collaris Say. Moderately abundant. Nos. 14306–7.

6. UTA BICARINATA Duméril. One specimen; No. 14248. The most northern locality for this lizard.

7. SCELOPORUS TORQUATUS Green & Peale; subspecies POINSETTII Bd. & Gird. Two specimens; Nos. 14233–43.

8. SCELOPORUS UNDULATUS Latr. Abundant; many of the males are without the undulating cross-lines. The most southern locality in Mexico.

9. SCELOPORUS GRAMMICUS Wiegm. One specimen; No. 14246. I mention here that the range of the *S. variabilis* has been recently extended a considerable distance to the northward of the limit, Monterey, which I gave in my synopsis of the species of Sceloporus in the Proceedings of this Society, 1885, p. 397. Mr. Wm. Taylor has found it near San Diego in S. W. Texas, and Mr. Eugene Aaron has procured it from near Corpus Christi. For specimens from the latter place I am indebted to my friend Mr. J. L. Wortman.

10. CNEMIDOPHORUS SEXLINEATUS Linn. Very abundant in three principal subspecific forms, which received names from Messrs. Baird and Girard. The characters displayed by these forms are instructive as showing how a longitudinally striped coloration may pass by insensible gradations into a cross-banded one. The subspecies and their forms are distinguished as follows:

Six longitudinal narrow stripes with unspotted interspaces..... subsp. *sexlineatus*.

Six stripes as above, the dark interspaces with small white spots..... subsp. *guttatus*.

Six stripes as above, wider, and very obscure; small obscure spots..... subsp. *No. 3*.

Six stripes as above, but wider, and the spots enlarged so as to be confluent occasionally with the light stripes. .....subsp. *No. 4*.

The stripes wider, and the spots confluent with them, so as to reduce the dark ground color to a series of rows of short transverse cross-lines.. subsp. *No. 5*.

The short black cross-bars more or less confluent across the positions of the light stripes, forming transverse cross-bands, which are generally best developed on the sides.....subsp. *tigris*.

Of the above forms all are numerously represented in the collection. The modification of the color pattern described, is not entirely due to age, as some of the largest specimens belong to subspecies *guttatus*, and No. 3. Nevertheless small specimens predominate in the subspecies *sexlineatus*, and large ones in the subspecies *tigris*. Subspecies No. 4 presents a good many small specimens. The form I described as *C. communis* (Proceedings Am. Phil. Soc., 1877, p. 95), from Southern Mexico, has the coloration of the subspecies *guttatus* and No. 4, but differs from them in possessing a frenoöcular plate. In a few cases, however, this plate is wanting in

specimens from the same locality, so that the form *communis* had best be regarded as another subspecies of the *C. sexlineatus*. The latter is the only one which is found in the Eastern and Austroriparian districts of North America.

Subspecies SEXLINEATUS; Nos. 14236–41–49–69; 14305.
Subspecies GUTTATUS B. & G. 14231–41–305–308.
Subspecies No. 3; 14231–50–308.
Subspecies No. 4; 14241–50–302–5.
Subspecies No. 5; 14237–50–302.
Subspecies TIGRIS B. & G. 14237–50–302.

11. EUMECES OBSOLETUS B. & G. Two specimens; No. 14244.

OPHIDIA.

12. SALVADORÆ GRAHAMIÆ Bd. Gird. Two specimens; Nos. 14255–95.

13. RHINECHIS ELEGANS Kenn. *Arizona elegans* Kennicott, U. S. Mex. Boundary Survey, Reptiles, page 18, Plate . *Pityophis elegans* Cope, Check List Reptiles N. Amer., p. 39.

This species exhibits all the characteristics of the genus Rhinechis, which is represented by a single species of Southeastern Europe, the *R. scalaris*. The genus agrees with Pityophis and Spilotes in its entire anal scutum; but differs from the former in having but two postfrontal scuta, and from the latter in its prominent rostral plate.

The Chihuahua specimen of this rare species differs somewhat from the type. It possesses twenty-seven rows of scales. The sides are of the darker tint of the dorsal spots, from which it results that the light interspaces of the dorsal region are entirely enclosed. There is no distinct row of lateral spots. No. 14298.

14. PITYOPHIS SAYI Schl., subsp. MEXICANUS D. & B. Several specimens; Nos. 14222–66–93–94.

15. COLUBER EMORYI B. & G. Five specimens, two with twenty-nine, and three with twenty-seven rows of scales. Most of them have the normal number of labial plates, eight; but one has nine on one side, and one has abnormally, ten on both sides. Nos. 14223–53–62–84–99.

16. BASCANIUM TÆNIATUM Hallow. One specimen; No. 14272.

17. BASCANIUM FLAGELLIFORME Catesby, subsp. TESTACEUM Say. Three specimens; Nos. 14224–79–83.

18. EUTÆNIA MULTIMACULATA Cope. *Atomarchus multimaculatus* Cope, American Naturalist, 1883, p. 1300.

The large numbers of this species taken by Mr. Wilkinson shows that Central Chihuahua is its headquarters. The specimens display a remarkable variability in coloration, and also prove that the azygos plate which exists between the prenasal plates of the typical specimen, is an abnormality. In one of the Chihuahua specimens there is an azygos plate between the internasals, which is of shorter form than in the type; while

in another there is an azygos plate between the prefrontals. In all of the others azygos plates are wanting. The ocular plates are normally 3–3, but the following variations occur. 2–3—2–3, one; 2–3—3–3, one; 2–2—3–3, one. The loreal is normally quite elongate; in one specimen it is shortened. The color varies from uniform brown above, to spotted in two styles. In one of these there are seven rows of brown spots with paler or rufous centres; in the other the brown borders of the spots have disappeared, and the rusty centres are represented by small rusty orange spots. The under surfaces are yellow, the gastrosteges with dark shading at the ends. In young specimens the head is more or less marked with obscure blackish marks. This species is distinguished by its long compressed muzzle.

The teeth in this species are equal, so that the genus Atomarchus to which I referred it stands related to Eutænia, as Regina does to Tropidonotus.

19. EUTÆNIA MEGALOPS Kenn. Cope, Proceeds. Amer. Philosoph. Society, 1884, p. 173.

Evidently the most abundant snake of Chihuahua. The large number of specimens sent display very little variation, and agree with one from New Mexico, described by me as above. The lateral band generally occupies only the third row of scales, but sometimes borders the fourth. The dorsal band very frequently occupies but one row of scales, but occasionally covers the halves of the adjacent rows. Nos. 14226–27–58–59–60–67–77–85–89–92.

20. EUTÆNIA CYRTOPSIS Kennicott. Cope, l. c., 1884, p. 174.

Only one specimen; No. 14256. The number of urosteges is exactly intermediate between the figures representing the supposed species *cyrtopsis* and *collaris* Jan. As there is no other difference it is probable that the latter name must become a synonym of the former.

21 HYPSIGLENA OCHRORHYNCHUS Cope. One specimen; No. 14287.

22. TRIMORPHODON VILKINSONII, sp. nov.

Scales in twenty-three rows. Superior labials nine, of which the fourth and fifth enter the orbit, and of which all are higher than long excepting the fifth and the eighth. Loreals two; oculars 3–3; temporals 3–3–3. Rostral not prominent, but the apex is recurved on the summit of the snout. Frontal plate rectangular, the lateral and anterior sides equal. Parietals narrowed posteriorly. Inferior labials eleven, the fifth in contact with pregeneials, and none in contact with postgeneials. Postgeneials much shorter than pregeneials. Gastrosteges 231; anal 1–1; urostoges 77. The body is compressed, and the head is very distinct. Total length, M. .272; of tail, .045; of head to rictus oris, .0092.

General color gray; the back is crossed by narrow black cross-bands, at rather remote intervals. These bands are pale bordered, and narrow to an apex below, which is above the gastrosteges. They become narrower

posteriorly, and on the tail form half-rings. On the extremity of every third or fourth gastrostege there is a small black spot, throughout the length to the tail. There is a larger black spot on the sides between the extremities of a few of the cross-bands. The superior border of the sixth, and the adjacent part of the fifth superior labial, is black. On the top of the head are three large round black spots; one is on the centre of the frontal and one is on the anterior part of each pariëtal. No cross-bands on the muzzle. The dark cross-bands are only two scales wide on the posterior part of the body; on the anterior part they are three or four scales wide. The interspaces vary from twelve anteriorly to seven posteriorly.

One specimen; No. 14268. This species is nearest the *T. biscutatus* D. & B. in squamation, but differs greatly in coloration from this or any other species of the genus.

I have given a brief synopsis of the species of this genus in the Proceedings of the American Philosophical Society for 1869, pp. 151–2. In introducing two new species I give another synopsis, the more, as I have received a considerable addition to my material since that date.

I. Scales in 21 rows; superior labials nine.

Head with brown chevrons above; back with diamond-shaped spots..... *T. lambda* Cope.

Head with a lyre-shaped pattern above; dorsal spots in pairs..... *T. lyrophanes* Cope.

II. Scales in 23 rows; superior labials seven.

Top of head black with a white T-shaped spot; dorsal spots entire transverse diamonds..... *T. tau* Cope.

III. Scales in 23 (4) rows; superior labials eight.

Top of head brown, with a small brown Y-shaped mark; dorsal spots transverse diamonds, more or less transversely divided by paler..... *T. upsilon* Cope.

IV. Scales in 23 (4) rows; superior labials nine.

Top of head brown; dorsal spots numerous transverse more or less divided diamonds..... *T. collaris* Cope.

Top of head white, with three round black spots; dorsal spot, few transverse undivided black rhombs, with pale edges... *T. vilkinsonii* Cope.

V. Scales in 25 (7) rows; superior labials nine. Top of head with chevron bands; dorsal spots formed of four confluent spots and enclosing a pale centre..... *T. biscutatus* Cope.

Of the preceding species I have before me one each of the *T. lambda; tau*; *collaris* and *vilkinsonii*. Of the *T. lyrophanes* there are six specimens; of the *T. upsilon* six, and of the *T. biscutatus* four.

I append a description of the new species *T. lambda*. The muzzle is rather elongate, as in the *T. biscutatus*. There are three loreals, and the oculars are 3–3; the temporals are 3–4–3–4. The fourth and fifth labials enter the orbit, and the sixth, seventh and eight are higher than long. Pregenecials longer than postgenecials. Internasals small, wider than long;

pariëtals rather short. Gastrosteges 234, anal 1–1; urosteges 83. Color above light gray crossed by brown transverse diamond-shaped spots, each with a pale transverse centre. Three or four of the most anterior spots are subhexagonal, being truncate at each side. All are surrounded by a pale shade. Each end of every second or third gastrostege is marked with a small dark brown spot, which extends upwards on the first row of scales, and sometimes is confluent with the lateral apex of the dorsal spot. Total length, .304; of tail, .054. From Guaymas, Sonora, presented to the National Museum by Mr. H. F. Emerich. No. 13487.

23 CROTALUS ADAMANTEUS ATROX B. & G.

One specimen; No. 14280.

24. CROTALUS ADAMANTEUS SCUTULATUS Kenn.

Five specimens; Nos. 14225–73–78. The tendency to the development of scuta on the head, especially on the pariëtal region, is greater than in any specimens I have seen from other localities.

GENERAL REMARKS.

The preceding investigation shows that the reptile fauna of the plain of Chihuahua is that of the adjacent regions of Arizona, New Mexico and Texas, with the accession of a very few forms which are more distinctively Mexican. Only two species come under this designation, viz: *Uta bicarinata* and *Sceloporus grammicus*. The *Eutænia cyrtopsis* has also an extensive Mexican distribution.

An Obituary Notice of James Macfarlane. By J. P. Lesley.

(*Read before the American Philosophical Society, December 4, 1885.*)

The Society has suffered, by the recent death of its member, Mr. James Macfarlane, of Towanda, in Bradford county, Pa., the loss of a man of distinguished abilities and sterling virtue, universally loved, respected and confided in, a practical business man of the first rank, a lawyer of great reputation, especially for his conduct of railway litigation, a judicious geologist especially devoted to the subject of coal, the author of valuable books in extensive circulation, and a citizen of the Commonwealth entrusted at various times with the conduct of public affairs.

He was elected to membership in this Society, Jan. 19th, 1883, and regarded it with genuine pleasure and pride, as the best recognition of his standing among men of science and literature, not only in his native State, but in this and foreign lands. But his busy life and literary works prevented him from making communications to the Society, at its stated meetings, which he could not attend on account of the distance from his home, the multiplicity of his engagements, and his failing health.

He became a member of the American Association for the Advancement

of Science, in 1880, and a fellow in 1882, and assisted at its meetings in Boston, Montreal, Minneapolis, Philadelphia and Ann Arbor, the latter but a few weeks before his death.

In 1872 Pennsylvania College conferred upon him the degree of Doctor of Philosophy.

He was appointed by Governor Hartranft, in 1874, one of the ten Commissioners for the Second Geological Survey, and was punctually present at all the quarterly meetings of that board up to the present year, taking the most lively interest in its proceedings, being an active member of its Publication Committee, and answering readily to every call for business consultation and official action in Harrisburg and Philadelphia around the year. In fact, he completely identified himself with the Survey and thought nothing a trouble which he could do to further its progress, or improve its operations. Its success has been largely due to the devotion of his singular intelligence and disinterested coöperation. His loss is felt severely in many places, but nowhere more severely than in the circle of distinguished men appointed to accomplish the will of the Legislature respecting the Geological Survey. His training in general geology, and his rare acquaintance with the coal measures, his experience in publishing his own scientific works, and his legal acumen, combined to make his appointment to this official post a fortunate event, and to make his sudden death a calamity. It may be said with truth that no other citizen of the State can be found to exactly replace him.

Shortly before his death he occupied another most useful and responsible office, that of Arbitrator for the general coal-trade centring at Buffalo in Western New York. His choice for such a post itself sufficiently marks the character of the man, and the distinguished consideration in which he was held by everybody, as a man of honor, intelligence and experience in affairs. He stood in the midst of many rival interests, both of capital and labor, a referee and mediator, an adjuster and a judge, armed with no powers but such as were voluntarily conceded to him by all concerned for the general good; and it is needless to say with what tact and skill, and integrity he fulfilled his difficult duties to the general satisfaction. That he was a good citizen, a loving friend and devout Christian will not explain it; for many a good man would fail to fill such a place for want of other qualities which he possessed. Some men are born to rule; others live to make themeselves the servants of mankind, and he was one of these, and died in the general public recognition of it; all honor be to his memory!

Middle Pennsylvania may be proud of its Scotch and Scotch-Irish settlement blood; its Hendersons and Hamiltons, its Rosses and Stewarts and Murrays, its McAlisters, McKinleys, McCormicks, McCauleys and McFarlanes; strong wills, bold hearts, long heads and stalwart bodies; great breeders of handsome and able children; a capable race for thinking strongly and executing vigorously the plans and purposes of men.

James Macfarlane was of this fine stock. His face wore the aspect of

intense vitality; his forehead was high and massive; his voice was pitched low, and his speech was decisive; he had no hesitations. One could divine at a glance why he was an ardent Christian and why he was a powerful legal pleader. He lived the life of a perpetual thinker, whose will was as urgently exercised as his reason and his imagination; for he lived in the thick of the general battle of life. Such men always come to the fore, and formulate events, and qualify the next generation. They hold the plough by both handles, and deepen the furrow at every tillage, turning up the subsoil sooner or later; doing all things thoroughly.

I speak of James Macfarlane warmly as a personal friend to whom I owe much; but I may be permitted to say that I regard with a sentiment akin to veneration the Scotch courage which could suffice to deliberately face and execute such an enterprise as the description of all the Coal Regions of America, and follow it with such another enterprise as his geological guide to the Railways of the United States, he, a practising lawyer and practical coal operator, as if he were a man of leisure. Such operations are only for the world's workers, born and bred to much thought and many deeds.

His first home was in Gettysburg, where he was born, Sept. 2d, 1819, and graduated at Pennsylvania College in 1837. That same year he joined the corps of civil engineers on the line of the North Branch canal, with headquarters at Towanda. After several years of this employment, he went to Carlisle, read law with Judge Graham, was admitted to the bar in 1845, and settled to practise in New Bloomfield, Perry county, for eight years, serving three years as District Attorney. Here he married Mary Overton, daughter of the late Edward Overton, who survives to lament his loss. In 1851 he returned to Bradford county to practice law at Towanda, being in 1852 elected District Attorney of the county, until 1859. He then accepted the position of General Superintendent of the Barclay Coal Company, which he relinquished, in 1865, to organize the Towanda Coal Company, which afterwards passed under the control of the Erie Railroad. He then became General Sales Agent of the Associated Blossburg Coal Company, with offices at Rochester, Syracuse and Elmira. In 1880 he organized the Long Valley Coal Company and developed its mines. In 1885 he was selected, as I have already said, to be Arbitrator of the Bituminous Coal Combination at Buffalo. When the combination was broken up, he returned to Towanda to work on a second and enlarged edition of his Geologists' Traveling Hand-book, or American Geological Railroad Guide, when, without warning, he died of heart disease, Oct. 15th, 1885.

He leaves his work half done, about 200 pages being in type, and many pages of MS. in a more or less finished state.

The Coal Fields of America is his most noted work and has had a large sale on both sides of the Atlantic. This brought him a considerable practice as an expert in coal operations. He wrote several geological articles for the American Encyclopedia, and one on the Bituminous Coal Fields of Pennsylvania for Gray & Walling's Atlas. He wrote also for the Evangelical Review.

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Sur le Rhinocheilus Antonii. Par Dr. Alfredo Dugès.

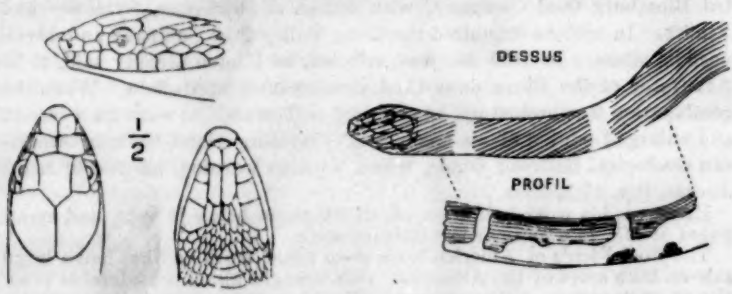
(*Read before the American Philosophical Society, January 1, 1886.*)

Je dédie cette nouvelle espèce de Rhinocheilus á la mémoire de mon père, le Prof. Antoine L. Dels. Dugès, bièn connu dans les sciences naturelles par ses travaux variés.

L'Ophidien qui fait le sujet de cette description avait été un peu sêché avant d'être mis dans l'alcool, de sorte qu'il est impossible de dire exactement quelle est la forme du tronc.

	M.
Longueur de la tête et du tronc	0.275
" " queue	0.035
Total	0.310

La tête mesure un centimètre de longueur; la queue est contenue 10 fois dans la longueur totale. Il y a 17 rangs d'écailles lisses luisantes, rhomboidales, au milieu du tronc; les latérales plus grandes que les médianes. Deux-cents gastrostèges. Anale indivise. On compte 38 urostèges simples, suivies de trois doubles, la queue étant terminée par un petit bouton allongé et sillonné. Les sous-labiales sont au nombre de 9, dont 4 en contact avec les sous-maxillaires, la 5ème plus grande que les autres. Deux grandes sous-maxillaires allongées suivies de deux autres petites que sont séparées par de petites écailles. Rostrale en forme de cuillère déprimée, saillante, dépassant la mâchoire inférieure, coupée obliquement en dessous, et rabattue en haut où sa pointe pénètre entre les deux préfrontales antérieures (internasales) sans les sèparer entièrement. Préfrontales postérieures plus grandes que les antérieures. Frontale, à six pans, plus large en avant qu'en arrière, à angle antèrieur très-obtus. Suroculaires triangulaires. Pariétales grandes. Nasale double; la postérieure est plus grande et à son bord antérieur s'ouvre la narine. Frénale assez petite, plus longue que haute, largement en contact avec la préfrontale postéri-



eure. Préoculaire unique, allongée verticalement, et séparée de la frontale par l'angle antérieur de la supraoculaire. Deux postoculaires. Deux

temporales assez grandes et allongées, suivies de six écailles semblables à celles du cou, mais que leur position indique comme des temporales. Huit labiales supérieures : la 1ère dépasse la narine ; la 2ème est en contact avec la nasale posterieure et la frénale ; la 3ème touche la frénale seule ; la 4ème est en contact avec la préoculaire et l'œil ; la 5ème avec l'œil et la postoculaire inférieure ; la 6ème avec la postoculaire inférieure et la temporale inférieure du premier rang ; la 7ème avec cette temporale et l'inférieure du second rang ; la 8ème avec les deux dernières temporales inférieures.

Les dents toutes égales n'offrent pas d'intervalle libre.

Le tête de ce serpent est á peine distincte du cou : elle est convexe à la région frontale, et le museau se relève légèrement en forme de groin. Les formes sont assez élancées. La pupille est circulaire.

Une grande tache noire couvre tout le dessus de la tête et s'étend en arrière d'une quantité égale sur le cou. La rostrale, le canthus rostralis, les postoculaires et les lèvres sont blanchâtres tachetées de noir ; le reste du dessous de la tête est blanc. Sur le corps et la queue on voit dix-neuf longues taches noires occupant chacune environ une vingtaine d'écailles en série longitudinale, séparées par des bandes blanches (sur l'individu en alcool, du moins) transversales qui couvrent 4 ou 5 écailles. Ces grands espaces noirs se continuent sous le ventre d'une manière très-irrègulière ; les uns interrompus, les autres formant comme un damier sans ordre.

Le seul exemplaire que je possède de cet Ophidien vient des environs de Mazatlán, côte du Pacifique.

GUANAJUATO, 17 Septembre, 1885.

A revision of the Section of Chemung Rocks exposed in the Gulf Brook Gorge at LeRoy, in Bradford County, Pennsylvania. By A. T. Lilley, of LeRoy.

(*Read before the American Philosophical Society, January 15, 1886.*)

	Feet.
1. Cap of Chemung with *Atrypa* and many unrecognizable forms in light shale, among which are *Spirorbis* and *Rhynchonella*.....	1
2. *Productella* bed in gray sand.....	10
3. Green shale.....	15
4. Red shale.....	4
5. Green Shale.....	20
6. *Grammysia elliptica* bed and gray shale	25
7. Iron ore, with *Spirifer, Pterinea, Crinoids, Grammysia, Spirorbis* and *fish remains*.....	4

	Feet.
8. Green shale	20
9. Red *fucoid* bed	8
10. Green sandstone	20
11. Red shale and sand with unrecognizable fossils	4
12. Conglomerate with pebbles, lime, *Spirifer*, *Productella* and *fish* remains	6
13. Green shale	10
14. Pink shale	2
15. Green shale	40
16. Green sandstone	2
17. Green sandstone	19
18. Gray sandstone	1
19. Green shale	52
20. *Strophomena bed*	1
21. Green sandstone	14
22. Green shale	40
23. Brown sandstone, with *Spirifer* and *Productella*	1
24. Gray sandstone, with *Crinoids* and *plants*	8
25. Green shale	6
26. Green sandstone and shale, with *Crinoids* and *Spirifers*	8
27. Gray sandstone and shale	60
28. Green sandstone, with *mollusks* and *Bothriolepis*	53
29. Red shale and sandstone, *Bothriolepis*, *Spirifera*, *Spirorbis*, *Rhynchonella* and *ferns*	14
30. Brown sandstone, with *shells* and *Holoptychius*	39
31. Green shale	6
32. Red sandstone, with *iron ore* and *mollusks*	8
33. Gray shale	8
34. *Calcareous iron ore* and sandstone *with crinoids*	12
35. Brown shale	20
36. *Calcareous iron ore* (red) and sandstone, *Bothriolepis*	11
37. Gray sandstone and shale, with *mollusks*, carbonized *plant stems*, iron and copper pyrites	2
38. Brown sandstone, with *Cryptonella*	10
39. Brownish sandstone, with *Spirorbis* and *Cryptonella*	35
40. *Crinoidal limestone*	4
41. Bluish shale	8
42. *Calcareous* red sandstone	9
43. Brown sandstone	18
44. Green sandstone, *Pterichthys rugosus*	8
45. *Calcareous* sandstone	4
46. Green sandstone and shale	90
47. *Calcareous* sandstone	5
48. Light-gray sandstone and shale	130

	Feet.
49. Gray shale	63
50. *Conglomerate*, with *mollusks*	3
51. Green shale	12
52. Green sandstone and shale	270
53. *Limestone* with *mollusks*	2
54. Gray sandstone and shale, with *Zaphrentis* and *Grammysia circularis*	220
55. Gray sandstone, with *fucoids*	1
56. Green sandstone, with *Dictyophyton*	42
57. Blackish shale, with *Lepidodendra* and *Calamites*	50
58. Green and brown sandstone and shale	100
59. Green shale	25
60. *Upper Ambocœlia bed*, with *Laxonema*, *Spirifer*, *Grammysia* and *Bellerophon*	2
61. Unexposed for	70
62. *Lower Ambocœlia bed* in green shale	50
63. Unexposed to line of Granville township	50
64. Green and olive shale, holding *Orthis*, *Chonetes*, *Cypricardites*, *Tentaculites*, *Pterinea*, *Tregonia* and *Rhynchonella*	150
65. Unexplored	183
66. Blue shale and sandstone	13
Total	2201

Mr. Lilley says in his letter that Granville Centre is on ground 250 feet lower (geologically) than the township line. Between the two is an exposure of about 150 feet of shale and sandstone containing *Orthis*, *Chonetes*, *Cypricardites*, *Tentaculites*, *Pterinea*, *Trigonia* and *Rhynchonella*.

He adds that Adam Dennis has recently bored a six-inch hole for water to supply his tannery, on the south side of the stream near Granville Centre. It is ninty-six feet deep; and the bottom thirteen feet was in blue shale and sandstone.

By combining these data the original section was enlarged and improved. But Mr. Lilley has used every opportunity during the last two years to increase its value, and has found forms which he is unable to name.

REMARKS ON INDIAN TRIBAL NAMES.

By W. J. Hoffman, M.D.

(*Read before the American Philosophical Society, February 5, 1886.*)

During the past fifteen years' experience with the numerous tribes of Indians of the United States, the present writer has frequently observed that certain tribes were not familiar with the names applied to them, as found in current literature, but that they had distinct tribal designations for themselves, which, for some reason unknown, were seldom met with outside of the tribe itself. Frequently a common term is met with, which may apply to a number of tribes, as the term Digger, which has been used with reference to at least fifty different tribes and bands along either side of the Sierra Nevada; so also with the word Snake, being used for several tribes and bands in Nevada, Idaho and Oregon.

It is the intention here to present the names of a few well-known tribes, and to give their tribal designations with such explanations as is possible. Many others might be added, but the following are deemed sufficient to illustrate the preceding remarks, and may serve as a contribution to a general work on the Ethnography of North America, which should of necessity embrace a synonomy as complete as practicable.

Tsa'nish.

The tribe of Indians known as the Arĭ'karĕ or Rees, forms the northernmost branch of the Panian linguistic family, and has for a number of years lived in the vicinity of Ft. Berthold, D. T., on friendly terms with the Mandans and Hidatsa. The alliance formed by these three tribes was not based upon friendly feelings for one another, but for mutual resistance against the Sioux on the south, and the occasional incursions of the Crees on the north. At the present day it is seldom that a Mandan, or a Hidatsa, will select an Arikare wife, though the contrary is of frequent occurrence. The village consisted, at the time of the present writer's last visit in 1881, of one hundred and thirty-four lodges, the eastern half being entirely occupied by the Arikare, who numbered about seven hundred and fifty souls, while three-fourths of the other half was occupied by the Hidatsa, and the remaining dwellings by Mandans. The total population of the village was about fifteen hundred.

The word Arĭk'arĕ, is of Hidatsa origin, and was changed by the Mandans into Ai-dĭk'-a-da-hu. The word signifies "The-people-of-the-flowing-hair," from a'-ra—*hair;* ka'-ra (or ka'-da)—*to run*, or *flowing*, and a-hūts' (a-hŭ')—*many*. The word is abbreviated, by the Hidatsa, into A-rĭk'-a-hŭ, and by the Mandans into A'-rĭ-kă'-ră, from which the common term is derived.

The tribal designation is Tsa'nish, a word employed at all times to denote the tribe in general, or an individual member thereof. The word signifies *people*, according to themselves, but the tribal designation in

gesture-signs signifies *corn-shellers*, and is made by loosely closing the left hand and holding it horizontally in front of the breast so that the thumb is directed forward; the right is then similarly closed with the thumb almost straight, and a motion made with the right against the left, as if shelling corn.

The following synonomy may serve for further study regarding this interesting tribe:

Tsa'nish.	Tribal designation.
Ta-nish. Sa-nish'.	Hayden. Eth. & Phil. of the Missouri valley. 1862. p. 356.
Stâr-râh-hé.	Lewis and Clark. 1806. p. 22. "Tribal name."
Starrahe.	Bradbury. Travels. Liverpool, 1817. p. 111.
Aracaris.	Gass. Journal, 1807. p. 400.
Aricaree.	Saxton, in Rep. N. P. R. R., 1854, p. 239.
Aricaris.	Gass, *op. cit.*, p. 48.
Aricas.	Prichard. Phys. Hist. Mankind, 1847. Vol. v, p. 408.
Arikara.	Brackenridge. Views of La. 1815. p. 76.
Arikkaras.	Maximilian. Travels. 1843. p. 143.
Arricaras.	Keating's Long's Exped. 1824. i, p. 424.
Arrickoras.	Webb. Altowan. i. 1846. p. 83.
Auricara.	Ind. Treaties. 1837. p. 447.
Black Pawnees.	Pritchard. *op. cit.*, p. 408.
Corn Eaters.	Culbertson. Rep. Smithsonian Inst. for 1850, p. 130. "Their own name."
Eokoros.	Coxe. Carolana. 1741, map.
Eskoros.	La Hontan (Schoolcraft's Travels in 1820). Albany, 1821. p. viii.
Pa-da'-ni. Pa-la'-ni. Pa-dai'-na. Pe-nai'-na.	So called by various bands of Sioux. Dialectic forms. Signifies *enemy*.
Pe-da-nis.	Warren. Nebraska and Arizona (1855–7), 1875, p. 50.
Pawnee-Rikasrees.	Nuttall. Journal. Philad'a, 1821. p. 81.
Racres. Recaro.	Lewis. Travels. 1809. p. 15.
Rees.	Franchere. Narrative. N. Y., 1854. p. 54.
la Ree.	Lewis and Clark. 1806. p. 22.
Rhea.	Hallam. In Beach's Ind. Miscellany. 1877. p. 134.
Ricara.	Lewis. Travels. 1809, p. 3.
Ricarees.	Maximilian. *op. cit.*, p. ix.
Ricaris.	Gass. Journal. 1807. p. 48.
Ricars.	Lewis & Clark. 1806. p. 24.
Rice Indians.	Franchere. *op cit.*, p. 54.
Rickaree.	Irving's Astoria. N. Y., 1849. p. 119.
Rikkaras.	Maximilian. *op. cit.*, p. 167.

Le Ris.	Maximilian. *op. cit.*, p. 167. "So called by Canadians."
O-no'-ni-o.	Hayden. *op. cit.*, p. 290. "So called by Cheyennes."
Ka'-nan-in.	Hayden. *op. cit.*, p. 326. "So called by Arapahos."
A-pan-to'-pse.	Hayden. *op. cit.*, p. 402. "So called by 'Crows.'"

SHO'SHONI.

The Sho'shoni tribe of Indians is a part of the Shoshonian ethnic division which formerly occupied the greater portion of country lying between the Sierra Nevada and the Rocky mountains, and from northern Idaho southward to the Moki villages, and across Southern California to the Pacific ocean. Within the last few centuries, another branch has extended toward the southeast, viz: the Comanche. According to Buschmann, and Gatschet, the Shoshonian tribes are an offshoot of the northern branch of the Nahuatl linguistic division.

The following brief synonomy is here presented for further investigation:

Sho'shoni.	Tribal designation.
Shoshonee.	Lewis and Clark. Allen's ed. 1817. ii, p. 587, *et passim.*
Shoshonie.	Parker (S.). Journal. Ithaca, 1842. p. 80.
Shoshocoes.	Ex. Doc., H. R., 31st Cong., 1st Session, pt. iii. 1849. p. 1002. — Schoolcraft, vi, p. 697.
Shoshokoes.	Irving's Astoria. 1836. p. 48.
Root Diggers.	Farnham. Travels. N. Y., 1843. p. 74.
Shothoucs.	Coke, Rocky mountains. 1852. p. 275.
Shirrydikas.	Ross. Fur Hunters. i, pp. 249, 251. "Are the real Shoshones."
Soshones.	De Smet. Letters. 1843. p. 36.
Alliatan.	Lewis and Clark, Exped. 1814. ii, p. 131.
Aliton.	Am. State Papers. IV. 1832. p. 710.
Serpentine Indians.	Lewis and Clark. Travels. 1809. p. 10.
Gens des Serpent.	" " " 1806. p. 60. So called by the French.
Slang Indianern.	Lewis and Clark. Van Kamper's Dutch ed. 1818. iii, p. 144.
Snake.	Ross. Fur Hunters. pp. 249, 251, and other authors.
Serpents.	De Smet's Voyage. p. 47.

Many other forms might be cited, but the above appear almost superfluous. The name Snake, it is said by one author, was taken from the Snake river flowing through the country of this tribe, on account of the numerous puff adders found upon its banks. Be that as it may, the word "snake" has no linguistic relationship whatever to the word "Shoshoni." The word ni^{n}'ama is used to denote the tribe as *people, first born*, but the word Sho'shoni, sometimes So'soni, is always given to designate the tribal name, at the same time the gesture-sign is added, by placing the closed

right hand near the right hip, forefinger extended and pointing forward, palm down, then as the hand is pushed to the front and toward the left, the hand is rotated from side to side, giving the index a serpentine motion. This is also the *sign* for snake, as a reptile.

It is quite natural to suppose, therefore, that when Lewis and Clark's party met with these Indians they at once considered the tribe to designate itself as *Snakes*, thinking, possibly, that the word Sho'shoni meant the same.

The writer has at no time during his frequent visits to these Indians been successful in obtaining from themselves a clear interpretation of the word.

The Rev. J. W. Cook, gives the Yancton Sioux word, as applied to the Sho'shoni, as Pe-ji'-wo-ke-ya-o-ti—*Those dwelling in grass lodges.* This term may have originated at a time when the Sho'shoni still built their lodges in the primitive form, a process described to the writer by some of the tribe, a short time since. Four poles were placed upright, at equal distances to form a square, each having a fork at the upper extremity for the reception of cross-pieces upon which to construct a roof. The sides of the square were closed by placing thin willow poles, vertically side by side, after which the broad leaves of water-grasses and rushes—*sho'nip*—were woven into them, horizontally, from side to side. By passing the end of a leaf in and out, or alternately in front of and behind these thin poles, a serpentine motion is observed, when viewed from above, which exactly corresponds to the gesture-sign and which, strange to say, was made when illustrating this method of constructing the walls of a lodge. It is the belief of the present writer, that the sign has reference to the weaving or building of a grass lodge, and that the word Shoshoni signifies something of *a similar nature.*

The term Shoshocoe [Shosho'ki], has been met with in current literature so frequently that a few words respecting it may not be amiss. The word is generally applied to those who go *on foot*, in contradistinction to Sho'shoni who own horses. Should a Sho'shoni, therefore, lose or dispose of his horse, he at once becomes a Shoshocoe. The term as applied, to signify a tribe or portion of a tribe, *i. e.*, as a tribal designation in the strict sense of the word, is therefore erroneous. What were these people before they possessed horses?

According to the chief men of the western Sho'shoni, their tribe was formerly composed of seven bands—which may, in reality, have been gens, as follows, viz:

I. Tu'kuari'ka. Mountain-Sheep-Eaters.
= *Sheepeaters.* Rep. Ind. Affairs for 1871, 1872, p. 432.
= *Tookarikkahs.* Bancroft. Nat. Races. i, p. 463.
= *Mountain Shoshone, or "Sheepeater" band.* Jones' Wyoming Exped. p. 275.
=*Tuka-ri'ka, "Mountain-sheep Eaters."* U. S. Geog. Surveys W. of 100th Meridian. vii, p. 410.

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II. Taza'aigadi'ka. Salmon-Eaters.
= *Aggitikkahs or Salmon-Eaters.* Bancroft. Nat. Races. i, p. 463.
= *Warareekas, Fish-Eaters.* Ross. Fur Hunters. i, p. 249.

III. Ti'vati'ka. Pine-Nut-Eaters.
= *Yampatickara.* Brownell's Ind. Races. pp. 533, 537.

IV. Sho'nivikidi'ka. Sun-Flower-Seed-Eaters.

V. Ho'handi'ka. Earth-Eaters.
= *Hohandikahs, Salt Lake Diggers.* Bancroft. Nat. Races. i, p. 463.
= *Hohan-tikara.* U. S. Geogr. Survey W. of 100th Meridian. vii, p. 409.

VI. Sho'hoaigadi'ka. Cottonwood-Salmon-Eaters.
= Boise. Rep. Ind. Affairs for 1871, 1872. p. 432.

VII. Ya'handi'ka. Ground-Hog-Eaters.

Of the above, the Tu'kuari'ka formerly occupied the country about the headwaters of Yellowstone river, the present head of the band Ten'doi, being also chief of the tribe. By birth he is a half Banak—or more properly Panai'ti. The Ti'vati'ka occupied the southern interior of Nevada, and were found, in 1871, living principally in the mountainous regions where there was an abundance of the Nut Pine (*Pinus edulis*), upon the fruit of which they subsisted to a great extent.

Panai'ti.

This tribe was formerly located west and north-west of the area appropriated by the Sho'shoni, embracing the eastern half of Oregon, Western Idaho and possibly a part of Washington Territory. According to extensive vocabularies collected by the writer, the languages of the two tribes are linguistically closely related, much more so than one is usually led to believe. The general designation for these Indians, as well as for many more along the coast side of the Sierra Nevada, is Digger. The following is a brief synonomy:

Panai'ti.	Tribal designation.
Banai'ti.	So called by the Sho'shoni.
Bwanacs.	Rep. Ind. Affairs for 1849–50. 1850. p. 49.
Bonarks.	Sen. Ex. Doc., 31st Cong., 2d Session, i, 1850. p. 198.
Bonacks.	Wilkes' Narrative U. S. Explor. Exped. iv, p. 502.
Bannacks.	Rep. Ind. Affairs, for 1871, 1872. p. 432.
Banattees.	Ross. Fur Hunters. i, pp. 249, 251.
Robber Indians.	
Ponashta.	Sen. Ex. Doc., 31st Cong., 2d Session, i (1st part), 1850. p. 158.

Poor Devil Indians.
Les dignes de pietié. } De Smet. Voy. ii, pp. 45, 46.

Banak.
Bannock.
Snake. } By authors generally.

But four bands exist at this day, which are known as the

Kutsh'undika.	Buffalo-Eaters.
Sho'hopanai'ti.	Cottonwood-Banaks.
Yam'badi'ka.	Yampa (root)-Eaters.
Wara'dika.	Rye-Grass-Seed-Eaters.

It is more than probable that seven bands existed in earlier times; but owing to the union of the Panai'ti and western Sho'shoni, it may be that the remaining three bands affiliated with similarly named bands of the latter, resembling in this respect frequent occurrences of like character among other tribes, notably so among those of the Dakotan linguistic division.

Coman'che.

This tribe is more nearly related to the Sho'shoni, linguistically, than any other of the Shoshonian family. According to several old and intelligent members of the tribe, the Comanches came to the country they now occupy, from the Northwest, since the introduction of horses. During their migration the tribe consisted of seven bands. A new band was formed, after leaving the Rocky Mountain divide, which was composed of individuals from all of the seven, and known as the Nau'niĕm—*Ridge People*, who remained behind to catch wild horses. When a sufficient number of animals had been captured they followed the tribe and the different individuals joined their respective bands. What length of time may have been required for horses (which were brought from Mexico by the early explorers, Coronado and his successors) to escape, and to increase sufficiently in number to run in herds along the eastern spurs of the Rocky mountains, is a subject difficult to solve. It may be presumed, however, that, if the story of the Comanches is correct, that their migration must have been made during the latter part of the 16th century.

Seven bands exist among the Coman'chĕ, as follows:

I. Yam'pari'ka. Yampa (root)-Eaters.
= *Yampah Indians*, of authors.
= *Yam-pa-se-cas*. Rep. Ind. Affairs. 1848. p. 574.
= *Samparicka*. Maximilian (of Wied). Travels. 1843. p. 510.

II. Pe'nete'ka. Honey-Eaters.

III. Ko'stshote'ka. Buffalo-Eaters.

IV. Tist'shinoie'ka. "Bad-Movers," *i. e.*, Those who move with difficulty.

V. Kua'hadi. Antelope People.

VI. Tini'ema. Liver-Eaters.

VII. Ti'tsakanai. The-Sewing-People, *i. e.*, Those who sew moccasins.

The temporary band, before mentioned as the Nau'niem—*Ridge People*—are given in Schoolcraft as Par-kee-na-um. Two other names of bands occur in literature, as well in the recollection of some of the Indians, but as individuals in those bands had the same name as that of the band to which they belonged, it became necessary at their death to rename the band, as the name of a deceased Comanche is never pronounced aloud. Therefore, the No'koni—*Movers*—became the Tistahnoie'ka—Bad-Movers, and the Wiuini'em—*Awl-People*, were renamed as the Titsakanai—*The-Sewing-People*.

The following brief synonomy will suffice for further reference and information :

Ni^{a}am.	Tribal designation. Signifies *people*.
Ayutan.	Brackenridge. Views of La. 1815. p. 80.
Bald Heads.	Long's Exped. Rocky Mts. 1823. i, p. 155.
Camanche.	Brackenridge. Views of La. 1815. p. 80.
Cannensis.	French. Hist. Coll. ii. 1875. p. 11. Note.
Ca'-tha.	Hayden. Eth. & Phil. Mo. River Valley, 1862. p. 326.—Refers to their having many horses.
Comandes.	Maximilian. Travels. 1843. p. 510.
Cumanche.	Farnham. Travels. 1843. p. 8.
Cumancias.	Long's Exped. Rocky Mts. 1823. i, p. 478.
Hietans.	Lewis and Clark. 1806. p. 76.
Iatans.	Irving's Astoria. 1849. p. 160.
Ietan.	Pike. Travels. 1811. p. xiv.
Iotan.	Irving (J. T.). Indian Sketches. 1835. p. 136.
Itean.	M'Kenney. Wrongs and Rights of the Indians. ii. 1846. p. 94.
La Paddo.	Lewis and Clark. 1806. p. 64.
La Plais.	Long's Exped. Rocky Mts. 1823. i, p. 155.
La Play.	Lewis and Clark. 1806. p. 17.
Na-uni.	Coues and Kingsley. Standard Nat. Library. 1883. pt. 6, p. 186.
Paducas.	Lewis. Travels. 1809. p. 15. [Said to signify wet noses.]
Padducas.	Pike. Travels. 1811. p. 347.
Padoucas.	Brackenridge. Views of La. 1815. p. 80.
Padoucar.	Lewis. Travels. 1809. p. 15.

Ni'^{a}am is the tribal designation, the word Comanche being of Spanish (?) origin, and the definition unknown. The Indians themselves generally pronounce it *Comántsh*.

Those who are familiar with the language spoken by most of the *Greasers*,

or lower class Mexicans, know how corrupted the Spanish language has become in the south-west portion of the United States. The Castilian words caballo, *horse*, becomes kawa'yo; cuchillo, *knife*, kutshi'yo, etc., the *ll* invariably becoming *y*. So also with numerous other words and phrases, as mucho, *much*, becomes muncho [or mu'ntsho]; muchos *many*, munchos; Adonde va Vd?—*Where are you going?* is abbreviated into *Unde va?* Upon the same basis of corruption and alteration, it is *possible* that the word Comanche may be an abbreviation for *many horses*, from the *greaser* words Kawa'yos—*caballos*, and mu'nchos—*muchos*, *i. e.*, many horses. Another suggestion might be offered with regard to the word, viz: ča (= casa), an antiquated Spanish word for house, or chief branch of a family, and mancha, a spot, stain, soiled, dirty; thus by slight alteration and corruption gradually becoming ca-manches—*soiled* or *dirty houses* or *lodges*. These suggestions are mere passing impressions, and are given for what they may be worth.

Kawĭ'a.

The numerous bands of Indians formerly scattered over the marshy country bordering on Tulare lake, the plains and western spurs of the Sierra Nevada, and the tributaries of the head of San Joaquin river, Cal., were known as the Tulareños, and later as the Tules. The most important band, being known as the Kawi'a, was located on "Kaweah" creek, and this name was, later on, applied to the Tule Agency bands generally. The various names comprising the sub-divisions of the tribe, given by Powers, in Contrib. N. Am. Ethnol., iii, are chiefly geographic terms and relate to some peculiarity of the region occupied, or to an abundance of some particular kind of vegetation, food, etc.

The term Yo'kŭt or Yo'kuts, previously employed to designate this tribe, as well as a distinctive term for a linguistic family, appears to be erroneous and inappropriate. To more clearly illustrate what may be stated below, it is necessary to present the subdivisions of the Kawi'as linguistically. The entire group of sub-tribes comes, at this date, under two heads, the Kawi'a proper, or Tule Indians, and the Tĭn'lĭu or Tejon Indians, the latter being divided, a portion of them living near Tule Agency, and the remainder scattered along the various settlements as far southward as Tahachapi pass.

The Kawi'a are composed of the following bands or sub-divisions, viz:

Yawitshĕn'nĭ. The Tule Indians proper.
Wĭktshŏm'ni.
= We-chummies. Rep. Ind. Affairs for 1857, 1858. p. 399.
= Wichumnies. " " 1872. p. 381.
Yo'ko.
Bâdwĭ'sha.
Bŏdĕr'wiŭm'ĭ.
Bo^{n}galaa'tshi.
Ya'wĕdmŏ'nĭ.
Tĭn'lĭu. Tribal designation of Tejon Indians.

The word Tejon undoubtedly originated with the Spanish and is merely a translation of the Indian word Tĭn'lĭu, *a badger hole;* in Spanish spelled Tejon from *Texon* (Portuguese *Teixugo;* Provençal *Tais, taiso'*), and does not originate from the many depressions found in the country occupied by this people, but from a myth having allusion to their origin in peopling the country by coming out of the earth through badger holes, and consequently calling themselves *Badger-hole People.*

The Yawitshĕ'nnĭ or Kawi'a, are called Yawĕdĕn'tshi by the Wĭktshŏm'ni, and the following brief synonomy may be of interest.

Kawi'a.

Keawahs.	Rep. Ind. Affairs.	1872.	p. 381.
Cowiahs.	*ibid.* " "	1854.	p. 11.
Chow-chillas.	*ibid.*	1856, 1857.	p. 252.
Cow-illers.	*ibid.*	1857, 1858.	p. 400.
Cowwillas.	*ibid.*	1861.	p. 218.
Tulare. Tule.	} By authors generally.		

About the year 1867, the Manache Indians, who had been living with the above named tribe, returned to their "old home" in Owen's Valley, Cal., about one hundred miles distant. It is singular that two tribes of apparently distinct linguistic families should voluntarily unite and live in harmony, especially when there are no hostile tribes from whom to fear attack. A great deal of friendship is also manifested between the Kawi'a and the Panamint Indians (who are also of the Shoshonian linguistic family). These facts would not be of sufficient consequence by themselves, but during the present writer's visits to Tule Agency, in 1882, and again in 1884, for the purpose of studying the magnificent pictographs, an astonishing similarity in many characters and figures was found, which had previously been observed in other portions of California, and in Arizona and Nevada, and which had been recognized as the work of various tribes belonging to the Shoshonian stock.* In addition to this, a number of bands belonging to the western Pah-Utes (of the Shoshonian family) lived, until quite recently, in various portions of the country assigned to the Kawi'a. The dialects of these bands was so far removed from the western Shoshoni language of Nevada and Idaho, the parent stem, as to be almost unrecognizable unless followed through the Pah-Ute and its various dialects.

Tentative comparisons of Kawi'a vocabularies with those of several bands of the western Pah-Ute, present some striking coincidences, more particularly in grammatic structure, but not sufficient to warrant any conclusions respecting linguistic affinity, as the material at present available is entirely too meagre.

* For further information, see papers by the present writer in Trans. Anthrop. Soc. Washington. ii. 1883, p. 128, *et. seq.*; Proc. Davenport Acad. Nat. Sci. iv. 1885, p. 105, *et seq.*

ABSA'ROKA.

This tribe is generally known as the Crows, a word originating no doubt from the gesture-sign used to designate themselves, which is made by placing the flat hands, palms down, in front of and outward from the shoulders, then imitating the movement of a bird's wings when flying. The first portion of the word absaroka is from *abita*, ab, an arrow-point, i *mouth* and 'ta *to kill, i. e.*, to kill with an arrow-pointed mouth, clearly signifying the habit of an accipitrine bird. The Indians stated to the writer that the true Absa'roka was a white, or nearly white, bird, exactly resembling the sparrow-hawk—*Falco sparíverius*. No specimen of the true absa'roka has been seen for many years, and it appears probable that the bird is a mythic one, particularly as it is described as white, or partly white. Animals and birds held as sacred are invariably white, and albinos, probably on account of their rarity, being deemed as endowed with supernatural and mystic powers. A partial synonomy is herewith added:

Absa'roka.	Tribal designation.
Absoroka.	Drake. Book of Indians. 1848. p. v.
Absarakos.	Warren. Nebraska and Arizona (1855–7) 1875. p. 50.
Upsàraukas.	Brown (J. M.). Beach's Ind. Miscellany. 1877. p. 83.
Apsaruka.	Maximilian. Travels. 1843. p. 174. "Their own name."
Atsharoke.	De Smet, Letters. 1843. p. 51.
Gens des Corbeau.	Lewis and Clark. Disc. 1806. p. 41. "So-called by the French."
Kee-kat-sa.	Bradbury. Travels in America. Liverpool. 1817. p. 19.
Keeheet-sas.	M'Vickar. Hist. Exp. Lewis and Clark. 1842. i. Map.
Kiqatsa.	Am. Naturalist, Oct. 1882. p. 829.
Crows.	By authors generally.

On the Hebrew Word ShDI (Shaddai), translated "The Almighty." By J. P. Lesley.

(*Read before the American Philosophical Society, January 15, 1886.*)

Several years ago I was led to examine all the Hebrew texts containing this word, and was surprised to see that they lend no countenance to the common translation of it; and that they teach a derivation of it from sources foreign to the Hebrew theology.

In the seven centuries which elapsed between the Seventy translators in Egypt and St. Jerome's Latin translation Christianity effected a great change in the view men took of things, both sacred and profane. The παντοκρατωρ of the LXX had a very different meaning from the

omnipotens of the Vulgate. The "power" of the first was not the "power" of the second. What was destructive ability before Christ became constructive ability after Christ. The terrible had been presented as the beneficent. *Παντοκρατωρ* was to be feared, for what strength could resist his blows, what coat of mail turn the point of his arrow? Omnipotens was to be confided in; for the universe was his handiwork; and he was able to do for his creatures more and better than they could ask or think. In his name there was no hint of violence; it meant absolute and infinite ability of action as against any conceivable hindrance.

On the contrary *κρατος* meant destructive, or at least violent force; as we see from *κραδαειν*, *κραδαινειν* to brandish weapons; *κραζειν* to scream; *κραταιος* resistless; *κρατερος* valiant, cruel, violent; *κρατειν* to rule, subdue, seize; allied to our words *crush* and *crash*. In view of this Greek habit of language we have a right to say that, when the LXX selected *παντοκρατωρ* as their synonyme for the Hebrew divine name ShDI, they must have conceived of him as an all-destroyer; at least as one who had exhibited his power in a violent manner; if they did not actually regard him as the divine spirit of evil; which is hardly to be supposed; although, I have been led by my study of the contexts to believe that this conception lay behind that of which they were avowedly conscious. For they wrote in Egypt, and this was the recognized character of the almighty Set. The Greeks of the Delta identified Set with the typhonic spirit of the universe.

The LXX translators being exiles and descendants of exiles from Judæa, must have been perfectly acquainted with the etymological force of the word, and to an extent somewhat, perhaps much, greater than we can be; for it is not likely that the whole Hebrew language of their day, much less of Salomonic and Mosaic days, was represented in our codex of their sacred books. How many words and phrases are lost we do not know, but the *ἁπαξ λεγομενα* tell a story of loss. But our reasoning must be based upon the language as preserved in those books, and it happens to be very rich in words for *power*. Some of them are pure metaphors, such as finger (אצבע), hand (יד), right hand (ימין), arm (זרע), horn (קרן), shoulder (שכם), thunder (רעם), a firman (שמר), chariot (הצן). Some of them represented purely passive power, strength to endure or resist assaults (like that of a bone) or wealth, or high position (עזם, תקף.) Many of them represented the delegated power of a magistrate, or ruler, or hereditary prince (שלט, שרה, רשין, רשת, נעח, מעצר.) Several of them meant heroic power, strength of body, stalwartness (כוח: חסן, גבורה) and especially as put forth in acts of strength (עז, עזן, חזק: compare עזיה strength of Jehovah, עזיאל God's power, עזי my strength). The word "very" (מאד) is used as a noun, with the meaning *power* (מאדו, his power). The word "god" (אל,איל) is used in the same sense (לאל; and מ-חיל). But the abstract idea of *strength* was expressed by דבא (Ecc. 9 : 16), translated with nice exactness by the LXX into *ισχυς*, which of itself shows that they did not confound it with *κρατος*.

None of all these words have a basis of ideal violence, but merely involve violence as an accident of the exercise of strength, not necessary but occasional.

For *violence* they used חמא, מערצה, פרך, פרק, חמס, עשק, רץ, גזל; all in reference to violation of peace and law, robbery, plunder, destruction of crops and goods, oppression by rulers, &c. For a violent rage they used רגז. But their special word for wasting and desolation, plunder and destruction, oppression, persecution, devourment, demolition and utter destruction was שוד, ShUD (Masoretic ShOD), the verbal form being ShDaD. Hence they called the *demons* ShDIM (Deut. 32 : 17), and *robbers* ShDDI-ShDDIM.* Even in composition ShD keeps its terrible meaning, for ShDF in Gen. 41: 23, 27, means the *blasting* of grain by the desert wind; and ShDFUN in Gen. 41 : 6, 1 K. 8 : 37, Amos 4 : 9, Deut. 28 : 22, the same.†

The point on which I wish to fix attention is this: The LXX translators must have been alive to the two facts: 1. That if the name of the deity for which they were to find a Greek correlative was a Hebrew name and had a Hebrew etymology, they must select from the list of Hebrew words meaning power the only one which was like ShDI, namely ShD, a demon, or ShDD, to commit violence, lay waste, desolate, oppress, destroy.

2. That in adopting this etymology they did it with the knowledge that ShDD never meant to be strong, powerful, except in a bad sense. For Gesenius himself admits this, while advocating the opinion that El ShDI was a *pluralis excellentiæ*, an epithet of Jehovah as almighty, omnipotent, against the contrary opinion of Verbrugg (De nominorum Hebræorum, 1752) and Ewald (Heb. Gram. pp. 298, 423).‡ Without the points the word is not necessarily a plural; ShDIM would be plural. It would perhaps be treating the Masorites too harshly to suspect that they pointed the word Shaddai intentionally to assimilate it with Adonai; but even if the charge was just it would not prove a plural.

The ShDI, παντοκρατωρ of the LXX, must necessarily therefore if derived from a Hebrew root, carry a malign, dreadful, destructive meaning, and it only remains for those who believe it to be an epithet of Jehovah to explain its use by reference to that terrible side of his character so often painted in the Hebrew scriptures.

The opposite aspect of Jehovah as a god of long suffering, abundant in goodness and truth, is also frequently presented. A common tone is given

*As the Hebrew PRK is represented in the Latin *frangere*, *fractum*, English *break*, *broken*, so the Hebrew ShD is represented in the English *shatter*, but not in Latin.

†The proper name ShDIAUR of Num. 1 : 5, 2 : 10, is translated by Gesenius the Darting of Fire.

‡In Ps. 17 : 9, Prov. 11 : 3, Is. 33 : 1, Jer. 5 : 6, 47 : 4, 48 : 1, 49 : 29, it means to practice violence, oppress, destroy. In Is. 15 : 1, 33 : 1 it expresses the horrors of a foreign invasion. In Ob. 5, "robbers of the night." In Judges 5 : 27, murdered. In Ps. 137 : 8, Jer. 25 : 36, 48 : 8, 18, 51 : 55, 56, to desolate a land. In Micah 2 : 4, and other prophets, to lay waste.

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to all the Hebrew writings by the frequent adoration of Jehovah in his two moods of affection for his people and violent hatred for those who are not his people. This tone is very harsh in the earlier books, but softens and sweetens in later times, until the modern idea of God as the all-father is almost completely developed.

But that is not the subject of this paper. I wish to keep in view the sole question, whether ShDI could have been an epithet of Jehovah; or whether, on the contrary, he was not a different deity, more ancient, and foreign to Palestine. To help settle this question I shall quote every passage in which the word occurs, both in the earlier and later books, to see what the context in each instance suggests. I hope in another communication to discuss the question in a broader way, by comparing data obtainable in countries outside the limits of Palestine.

It is necessary however to add one more item to these prefatory statements, viz: the fact that the Hebrew language had two words written ShD, which must have been differently pronounced, although it is impossible to say what the difference was. In the early Christian centuries Hebrew scribes distinguished these two words by marking one to be pronounced short and the other long, Shad and Shâd, or Shed and Shēd, like the English ship and sheep. But whether this Masoretic punctuation preserved correctly the tradition of the ancient difference of pronunciation is a matter of debate among the best scholars.* It is, however, a very convenient way of distinguishing the two words: ShḚD, a demon, as above described, and ShaD, the female breast or teat,† from which I would derive a word for wife, ShDE, which occurs only once in the Hebrew Scriptures (Ecc. 2 : 8). It is a curious fact, and bears upon our subject, that Gesenius rejects this plausible etymology and prefers to derive ShDE, from the other ShD (which he now says means simply *power*, although he has elsewhere said that it never meant *power* except in a bad or destructive sense), translating it not *wife*, but *mistress, domina*.

I leave to others to explain how two such irreconcilable ideas came to be expressed by the same word; how ShD could be used to express both destruction and nutrition, a midnight robbery and a woman's breast, the invasion of savage enemies and the suckling of children. But I will show that both these two irreconcilable ideas are involved in the texts relating to the deity ShDI, who is regarded (sometimes in the same passage) as the god of vengeance and destruction and as the god of covenant promise of

* I cannot see how it can be of any value, seeing that it is not consistent with itself; for in Lam. 4 : 3, the word is pointed short, שַׁד; in Job. 21 : 9, Is. 60 : 16, long שׁוֹד, and in Hosea 9 : 14, Cant. 4 : 5, Gen. 49 : 25, also long שָׁדַיִם the two breasts. Gesenius derives this ShaD from an obsolete Shadah, allied to the Chaldee and Arabic verbs "to cast, shoot, pour, moisten, irrigate." In other words, it has no known Hebrew etymology. It certainly has nothing to do with the old Egyptian BNTT (Benti), the two dugs (Pierret's Dict., p. 131), nor with the Coptic form MNOT, mamma.

† ShD in Hebrew exactly corresponds to τιτθή, and teat.

boundless prosperity and posterity; that he is in a very especial manner regarded as the god of generation and increase, and in so striking a form is he thus presented, that his name might without any violation of logic be derived from ShD the female breast or teat.

Gen. 17 : 1. This is the first appearance of ShDI in the Mosaic books. If El Shaddai meant God the Almighty, his appropriate first appearance would be in the stories of the creation. But the word is not used until the story of the Covenant with Abram is reached.

This covenant is sealed by a change of Abram's name to Abraham. First a son, and then a countless progeny is promised ; nations and kings are to come from him ; Caanan is to be possessed ; circumcision is enjoined ; Sarai's name is changed to Sarah ; Isaak is only promised ; but Ishmael is blessed, and twelve princes are to come from him and a great nation ; and the story winds up with the act of circumcising Ishmael and the rest of the household.

This remarkable story, of unknown date, opens with the words : "And when Abram was ninety-nine years old, Jehovah appeared to Abram and said to him, 'I am *El SheDI*, keep walking before me and be faultless.'" After this, Jehovah is not again mentioned, nor is *El Shedi* repeated, but *El* recurs eight times.

It is evident that the story was borrowed by the Hebrews from the Arabs, for *Ishmael* is its hero, and Isaac is of no account. A great nation, subdivided into twelve tribes each, with its own princedom is to descend from Ishmael, for whom Abram pleads, and whom *El* specially blesses. The promise to Abram of a countless posterity is apparently to be realized through Ishmael ; Isaak is not yet born. The Hebrew compiler seems to have imitated the two great features of the Arab story (the change of Abram's name and the blessing of Ishmael) with the only materials left to him, to save the amour propre of the Hebrews, by changing Sarai's name and promising Isaak.

If the story be one thus borrowed, it is easy to understand why the Hebrew writer glossed the first verse in a Hebrew sense by the insertion of the word Jehovah and the explanation that he, Jehovah, was *El Shedi*. The original story, as told of their own ancestral beginning by the Children of the Desert, probably began : "When Abram was ninety-nine years old the god *Shedi* appeared to him and warned him to continue always to be his faultless servant." As to circumcision, it is well known that the Egyptians and Libyans practiced it in ages preceding any date assignable to Abram.

Gen. 28 : 3. The next appearance of *El Shedi* occurs in an Idumæan legend : Esau is overheard by Rebecca threatening to kill Jacob. She advises Jacob to fly, and pretends to Isaac that she fears Jacob will marry some Hittite girl, that is, some young beduine of the Kadish Barnea country. Isaac therefore sends his son to Mesopotamia for a Chaldean wife, saying : "and *El Shedi* will bless thee and make thee the fruitful

sire of a horde of nations, and give thee Abraham's blessing and his promised lands."

After describing Esau's marriages and settlement, the story of Jacob's journey is taken up, and then, and not until then, comes in the name Jehovah, "I am *Jehovah Elohi Abraham*, thy father," &c., who promises him a great covenant people. Jacob, awakened and affrighted, erected a stone and called the place, not *Bethjah*, but *Bethel*.

Gen. 35 : 11. The third time *El Shedi* appears it is under precisely similar circumstances; Jacob returns from Mesopotamia to Bethel, with a great household and builds an altar, this time dedicating it by the name of (not Jehovah, but) *El-Beth-El*, "because El had appeared there to him when he fled from his brother." And El now again appears to him and repeats the blessing; changes his name from Jacob to *Isra-El*, saying, "I am *El Shedi*, be fruitful and multiply; a nation, a horde of nations shall be of thee, and kings shall come from thy loins;" the land was again promised, and then "*El* ascended from him in the place where he talked with him."

Gen. 43 : 14. The fourth place the name appears is in the story of the famine, and from Jacob's mouth. "Take also your brother (Benjamin) and arise, go back to the man (Joseph, now prince of Egypt) and *El Shedi* give you mercy before the man, that he may send back to me your other brother and Benjamin too.* But if I be bereaved (of my children) I am bereaved." *i. e.*, *El Shedi* promised them to me at Bethel, and if he takes them away again, I must be resigned. There is here again no mention of Jehovah. *El Shedi* is evidently the tutelary deity of the Abrahamic nomades. And he is evidently in some mysterious way the god that gives increase.

Gen. 48 : 3. The next occurrence of the word carries out this idea exactly. It is again Jacob who says to Joseph "*El Shedi* appeared unto me at Luz (Bethel) and blessed me and said to me, 'Lo, I make thee fruitful * * * a host of peoples, and give this land to thy seed forever.'" There is no reference to Jehovah.

Gen. 49 : 25 is very remarkable. *El Shedi* here occurs in Jacob's blessing, and in that part of it addressed to Joseph (Ephraim and Manasseh, the ten tribes, and not at all to Judah), but he divides the *El* from the *Shedi*, and assigns them two separate tasks:—"By the *El* of thy father who shall *help* thee, and by the *Shedi* who shall *bless* thee with blessings," &c. &c. If *Shaddai* be as the commentors fancy "the Almighty," then Jacob ought to have reversed the parts of his blessing, and said: "By *Shedi* who shall *help* thee, and by *El* who shall *bless* thee," &c. It is clear that the idea of a blessed posterity, fruitfulness, &c., is organically involved in the word *El Shedi* as used six times in Genesis.

It must be noted no article is prefixed to *El* nor to *Shedi;* but a curious poetic balance is preserved by inserting אֵת before *Shedi*. It really means

* If Joseph was under the Hyksos, he also must have had the god Seti as his god, and this reference to Shedi's influence over Joseph has a double value.

nothing, but it balances the אל *El* of the first division of the verse. In the five previous occurrences, which are all prose, *El* and *Shedi* occur in combination; in this sixth occurrence, in a poem, the *El* and the *Shedi* are separated, but instead of *El Shedi* the poet writes *Et Shedi*.

Exodus 6 : 3. Here we have a legendary commentary on the use of *El Shedi* in Genesis. "Then Jehovah said to Moses * * * I am Jehovah. I appeared to Abraham, Isaac and Jacob as (ב)* *El Shedi*, and by my name Jehovah was I not known to them; and I established my covenant with them to give them the land of Canaan * * * I remember my covenant * * * I will bring you out of Egypt," &c., &c. It is surprising how the ideas of covenant and land cling to this term *El Shedi*, and how not a suggestion of violence, or the need of almightiness, is made in any of the legends which carry the term *El Shedi*. The god thus named is evidently the family or tribal deity of the Abrahamidæ, quite different from the Jehovah of the later Jewish cult. This is the only place in the book of Exodus where *El Shedi* appears, nor does it appear at all in Leviticus. But in

Numb. 24 : 4, it turns up again and significantly enough in the rhapsody of the Chaldean prophet Balaam Ben Beor: "And he took up his parable and said: Balaam Ben Beor speaks; the man of open eyes speaks; he speaks who hears the words of *El*, who sees the vision of *Shedi*, entranced (?) open eyed," &c. Here again *El Shedi* are poetically parted for sake of the rythm. But the same old theme is harped upon. It is always *El Shedi's* covenant and promise of Canaan to Abram: "How goodly are thy tents oh Israel! * * * As the valleys * * * gardens * * * trees * * * planted * * * pour water from his buckets * * * seed in many waters * * * his king higher than Agag, his kingdom exalted. *El* brought him out of Egypt, strong as a unicorn, he shall eat up the nations his enemies, break their bones, pierce them with arrows, crouching like a lion," &c.

Here we see the first and current idea of *fertility* (*shet*), supplemented at length by the idea of *violence* (*shet*), and the two combined in the most poetic style. It is needless to add that all thought of Jehovah is absent. The story belongs to Moab or the lands east of the Dead sea.

Ruth 1 : 20, 21. We meet with no *El Shedi* in Deuteronomy, which is wholly given up to Jehovah worship, nor in Joshua, nor in Judges. But in another Moabite legend—that of Ruth—Naomi says to her old acquaintances in Bethlehem, after her return from Moab: "Call me not Naomi (the pleasing), call me Mara (bitterness), for *Shedi* has dealt very bitterly with me. I went out full and Jehovah has brought me home empty. Why call me Naomi, since Jehovah has testified against me, and *Shedi* has afflicted me.

In the Arabic poem of Job (included among the sacred books of the Jews) we might expect *El Shedi* to appear frequently, from the facts already mentioned, and also from the striking fact that the name Jehovah occurs

* If this ב were a כ we could account for it; but an exact translation with כ should read "I appeared to Abraham . . . *in El Shedi*," as if it were the name of a place, *i. e.* Bethel. It is hardly possible that באל should here be Baal.

only once in the whole book: "Then Job arose (after hearing of the utter destruction of his whole family and all his possessions) and rent his mantle and shaved his head and fell on the ground and worshiped, and said: Naked I issued from the womb of my mother, and naked shall I return thither; Jehovah gives and Jehovah takes, let the name of Jehovah be blessed. In all these Job sinned not, and gave not spit (תפל ה) to *Elohim*."

This single allusion to Jehovah occurs in an evidently *proverbial* form, at the close of a historical prose introduction to the original poem; an introduction which may or may not be ascribed to the Jewish compiler. At all events the total absence of the name of the Jewish deity from the poem itself renders its occurrence in the prologue sufficiently suspicious.

In strong contrast to this absence of the name Jehovah is the constant use of the names *Eloeh*, *Elohim*, and *Shedi*. The introduction opens thus (Job 1 : 1): "There was a man * * * who * * * feared *Elohim* and avoided sin." And in the beginning of the poem (Job 3 : 4): "Job opened his mouth and cursed his day * * * Let that day be darkness; let *Eloeh* not look at it from above," &c. It is evident that the race to which Job belonged worshiped a deity called *Elohim* (or worshiped gods, *Elohim*, it would be hard to decide which), for in the opening verse of the 2d chapter they are called *Beni Elohim*, just as the Hebrews were habitually called *Beni Israel*.

The deity name *Shedi* occurs (not in the introduction, nor in the conclusion, but) in the poem itself *thirty-one times*, and the deity bearing this name is described as inscrutible (11 : 7, 37 : 23), omniscient (24 : 1, 40 : 2) giver of inspiration and life (32 : 8, 33 : 4), just in judgment (8 : 3, 31 : 35, 34 : 10, 34 : 12), paying no regard to complaints that are silly (35 : 13), open to prayer (8 : 5, 13 : 3), punishing the wicked (27 : 13), wrathful when offended (21 : 20), building up, defending, delighting and being with his worshipers (22 : 23, 25, 26, 29 : 5).

At the same time Job complains that "the arrows of *Shedi* are (sticking) in him (5 : 4), that *El* has killed his heart (הרג for הרך) and *Shedi* has troubled him (23 : 16), that *Shedi* hath vexed his soul (27 : 2). But apparently he vents these complaints without feeling any disrespect towards the deity.

In the same mental mood, Eliphaz the Temanite, says (5 : 17) "Lo! Happy the man whom *Eloeh* correcteth, and the chastisement of *Shedi* (מוסר שדי) despise not." Job replies (6 : 14): "To the afflicted from a friend pity! and (but) the fear of *Shedi* he forsaketh." "The wicked man" (15 : 20) is described by Eliphaz as "stretching his hand against *El* (nateh el *el* ido) and making himself a hero against *Shedi*" (v el Shedi ithgabar) (15 : 23). And Job in his turn describes "the wicked" (21 : 7) as saying, "What is *Shedi* (meh Shedi) that we should serve him, and how shall we profit by praying to him?" Of the hypocrite he asks (27 : 10) "Will he delight himself, or rather, does he make himself an object of pleasure to *Shedi* (im ol Shedi ithonan), does he ever call on *Eloeh* (iqra eloe b'col oth)?"

Eliphaz seems to have a very unanthropomorphic notion of *Shedi*. He begins one of his discourses thus (22 : 2) "Can a hero (geber) be profit to *El*, as a sage is profit to himself? Is it delightful to *Shedi* that thou art righteous (zedek), and is it gainful (to him) that thy ways are good (tam)?" And then he goes on to show Job that *Shedi* simply regards him as a sinner and punishes him as such, and not at all out of any personal considerations.

One more reference to *Shedi* is made in this poem, and it requires separate consideration, because it takes us back to the ideas of covenant and inheritance. Job (31 : 2) is attesting his uprightness. "I made a covenant with my eyes, and why should I think on a maid, and what has *Eloeh* allotted (as my portion) from on high, and what *Shedi* as my inheritance? Is not destruction the lot of the unrighteous, and misfortune that of the evil doers? Does he not see my ways, and count my steps?" &c.

It remains only to draw attention to the poetical balancing of *El* (*Eloeh*) against *Shedi*, proving that the full name was *El Shedi*, or *Eloeh Shedi*, throughout the book.

The absence of any article would prove the vulgar translation of *Shedi* as "the almighty," to be a mistake, apart from all other arguments. It would be just as reasonable to expect an article with *El* or *Eloeh*, "the god." *Shedi* is evidently as personal a proper name, as *Baal*, or *Jehovah*, or *Seti*. The translation "the almighty" falls to the ground with the etymology of *Shedi*, from *Shed* strong; and we have seen that *Shed*, among its various meanings, has one which does not mean strong, but *violent*.

It is true that the *El Shedi* of the poem of Job is rather an amiable deity. But this he would undoubtedly be in the eyes of his original worshipers in Arabia. The poem hints plainly enough that he could be a typhonic demon to "the wicked," that is to people who worshiped other deities and cared nothing for *Shedi*.

In the Psalms the name *Shedi* occurs only twice.

Ps. 68 : 14. This superb chant, beginning "Let *Elohim* arise, let his foes be scattered; let his haters flee before him. As smoke is driven, as wax is melted, let the wicked perish from the face of *Elohim;* but let the righteous rejoice," &c. "Extol the cloud-rider by his name *Jehovah*." "Jehovah gave the song of victory, messengers of victory to the great host." "The kings of the hosts flee, they flee, and the housewife divides the booty; when ye rest among the cattle stalls, where doves' wings are silver white, with golden feathers." "In *Paras Shedi*, kings therein, it snowed in Salmon." No clear meaning can be made out of this part of the Psalm, but either *Paras Shedi* was the name of a place "the scattering of Shedi," or *Shedi* was supposed to rout the kings on the snow-covered Salmon. At all events the mixture of *Jehovah*, *Elohim* and *Shedi* in this wild war song is very remarkable.

Ps. 91 : 1. We have in this song no mention of *Elohim*, but a mingling of *Oliun*, *Shedi* and *Jehovah*, none of them with an article: "Sitting beneath the protection of *Oliun* (the highest), resting in the shade of *Shedi*,

I say to *Jehovah*, my safety place, and my fortress, my god (אֱלֹהַי), I confide in him." It is evidently a song of the desert. The angels bear him up lest he stumble among the rocks; he is saved from the lion and the snake and the dragon (whatever that was). It looks as if "under the shade of *Shedi*," was a proverbial expression among the Beduin.

Isaiah has *Shedi* only once (13 : 6): "Howl! for the day of Jehovah comes, it comes like devastation from *Shedi* (k-ShD m-ShDI). The alliteration suggests that *Shedi* was the Typhonic demon, and nothing could be more appropriate; for Isaiah is prophesying against Babylon's utter destruction, to be produced by an invasion from the mountains of many nations. DeWitte translates *ShD* "verheerung." It is not to be supposed that Isaiah would not have frequently employed *Shedi*, if it meant "almighty" as an epithet for Jehovah. This is the only time he uses the word.

Jeremiah appears not to have known the word.

Ezechiel uses it only once (1 : 24), in describing the four-visaged creatures which appeared to him out of the fiery cloud in Chaldea; their heads supported a platform (firmament) of crystal, on which was a throne of sapphire, and on the throne sat a man of amber-colored fire, over-arched by a rainbow; "this was the appearance of the likeness of the glory of Jehovah," a well-guarded expression. The creatures had living wheels, self-intelligent, "their spirit being in the wheels," and "the voice (קוֹל) of their wings was like the voice of mighty waters, like the voice of *Shedi*" (*k-qol Shedi*); probably meaning "like a roaring storm wind in the desert." Compare "qol Jehovah" breaketh the cedars of Lebanon. "When they moved they made a noise like a whole host."

Daniel. This book does not mention Shedi, but it makes mysterious reference to a "god of forces" (11 : 38).

Joel alone among the prophets of Palestine speaks of *Shedi*, and that only once (1 : 15), and then in the sense of a destroyer. "Alas the day! for the day of *Jehovah*, and it will come like destruction from *Shedi* (*u·k·ShD m·ShDI ibua*).

Joel repeats precisely the phrase in Isa. 13 : 6, with its alliteration; which seems to settle it beyond doubt that Isaiah and Joel used *Shad Shedi*, as a well understood formula; perhaps a popular expression for a *razzia* of Beduins, or perhaps for a sandstorm. But whatever special meaning it had must have been based on a conception of the typhonic demon of destruction like the *Seti* of the Egyptian monuments, and the *Shaitan* (devil) of Mohammedan literature.*

*It is interesting to compare *Seti*, *cut stone* and *heap of stones* with the modern Mohammedan practice of *throwing stones at Sheitan*, resulting in the accumulation of piles of stones, at certain fixed places, all of them regarded as either sacred or accursed.

Stated Meeting, November 6, 1885.

Present, 18 members.

President, Mr. FRALEY, in the Chair.

Mr. William John Potts, a newly-elected member, was presented to the Chair and took his seat.

Donations for the Library were received from the Deutsche Geologische Gesellschaft, Berlin; Naturhistorischer Verein and Prof. J. Lehmann of Bonn; Schweizerische Naturforschende Gesellschaft, Luzerne; R. Accademia dei Lincei, Rome; R. Istituto Veneto di Scienze, &c., Venice; Académie Royale de Belgique; Royal Geographical Society, Meteorological Council, Royal Meteorological Society, Nature, Messrs. Joseph Prestwich, C. W. King, Wm. Barlow and Dr. Benjamin Ward Richardson of London; the Philological Society, Cambridge, England; the Canadian Institute, Toronto; Natural History Society, Montreal; Essex Institute, Harvard University, Museum of Comparative Zoölogy, Cambridge, Mass.; and American Antiquarian Society, Worcester, Mass.; American Journal of Science, New Haven; American Chemical Society, Meteorological Observatory of New York; the Young Men's Library at Buffalo; Mr. John B. Smith of Brooklyn; the Engineers' Club, Franklin Institute, Historical Society of Pennsylvania, Dr. J. M. Hays, Prof. E. D. Cope and Messrs. Henry Phillips, Jr., McCalla & Stavely, and Rev. H. Clay Trumbull, of Philadelphia; Johns Hopkins University and Prof. Ira Remsen of Baltimore; the United States Fish Commission, National Museum, Naval Observatory, Geological Survey, the Department of State and War Department; Mr. Jed. Hotchkiss of Staunton, Va.; the Elliott Society of Science and Art, Charleston, S. C.; and the Society of Natural History, Cincinnati.

Letters of envoy were received from Die Schweiz. Gesellschaft (Berne); Wm. Barton (London); United States Geological Survey (Washington, D. C.); Museum of Comparative Zoölogy (Cambridge Mass.); Canadian Institute, Toronto

(with Vol. XXXI, 143), and requesting exchange; which, on motion, was granted and the Society placed on Exchange list.

Letters accepting membership were read from W. J. A. Bonwill, M. D. (October 28, 1885, 1721 Locust St., Philadelphia); Thomas M. Cleemann, C. E. (October 19, 1885, 2135 Spruce St., Philadelphia); Wm. John Potts (529 Cooper St., Camden, N. J., October 20, 1885); Prof. Edward North, LL.D. (October 26, 1885, Hamilton College, Clinton, N. Y.); Prof. M. Schele DeVere (October 20, 1885, University of Virginia).

Letters acknowledging receipt of diploma were read from Prof. Henry S. Frieze (Ann Arbor, Mich.); Isaac Sharpless (Haverford College P. O., Pa.); Prof. John W. Mallet (University of Virginia); Prof. Walter LeConte Stevens (Hoboken, N. J.).

Letters were received from the Chief Signal Officer, U. S. A., Washington, D. C., requesting certain Proceedings and Transactions.

On motion the Signal Office was placed on the Exchange list and ordered to receive Proceedings.

A letter was received from Prof. E. C. Pickering of Harvard College Observatory, requesting a copy of Transactions, Vol. IX, containing a paper by the late Robert Treat Paine, which was ordered to be sent.

Letters were received from the Geological Survey of Canada, Ottawa, acknowledging Nos. 116 and 119; E. W. Claypole (Akron, Ohio), acknowledging Nos. 117, 118, 119, 120; Wm. John Potts (Camden, N. J.), acknowledging Nos. 117, 118, 119, 120; Mr. Thomas M. Cleemann (Philadelphia), acknowledging Nos. 117, 118, 119, 120.

Dr. W. S. W. Ruschenberger read, by appointment, a sketch of the life of the late Robert E. Rogers, M. D., LL.D., with biographical notices of his father and brothers; after which the President and Dr. Horn made some appropriate and feeling remarks on the subject.

The death of Thomas Davidson (Brighton, England), was announced as having taken place on October 16, 1885, in the 69th year of his age.

Nominations Nos. 1064, 1065 and 1066, were read.

The Publication Committee, pursuant to the request of the Society of June 19, 1885, made a report which, after discussion, was laid over to the next meeting.

Permission was granted to Prof. Cope to withdraw the paper read by himself at last meeting on the Eocene fishes of Wyoming Territory and the action of the Secretaries in permitting its withdrawal was approved.

Prof. Cope presented estimates for plates for his paper read at last meeting on the Structure of the Brain, &c., * * * of a Theromorphous Reptile, which, on motion, was referred to the Finance Committee for action.

The President reported that he had received and paid over to the Treasurer $132.43, amount of Michaux legacy due October 1, 1885.

And at ten minutes after ten o'clock, P.M., the meeting was adjourned by the President.

Stated Meeting, November 20, 1885.

Present, 16 members.

President, Mr. FRALEY, in the Chair.

Dr. W. J. A. Bonwill, Mr. Thomas M. Cleemann, Prof. S. W. Gross, newly-elected members, were presented to the Chair, and took their seats.

Donations for the Library were received from the Mining Department, Melbourne; Royal Society of Victoria; Royal Asiatic Society (North China Branch); Geological Survey of India; Zoölogischer Anzeiger, Leipzig; Verein für Geographie und Statistik, Frankfurt-am-Main; Prof. G. vom Rath, of Bonn; the Nordisk Oldkyndighed og Historie Selskab, Copenhagen; Statistika Central Byrån, Stockholm; Musée Teyler, Haarlem; the Ministère de l'Interieur and Commission Centrale de Statistique, Bruxelles; R. Acca-

demia dei Lincei, Rome; Société Nationale des Sciences Naturelles, Cherbourg; Société des Antiquaires de France; Société Americaine de France; Société d'Anthropologie; Société Zoölogique and Société de Geographie, Paris; R. Academia de la Historia, Madrid; Royal Astronomical and R. Geographical Societies, Meteorological Council, Journal of Forestry, and Nature, London; Literary and Philosophical Society, Liverpool; Philosophical Society, Glasgow; Boston Society of Natural History, Mr. Robert Nixon Tophan, Cambridge, Mass.; American Antiquarian Society, Worcester; Meteorological Observatory of New York; the Mercantile Library Association of Brooklyn; Academy of Sciences of Philadelphia, Mercantile Library and Mr. Henry Phillips, Jr.; Johns Hopkins University; Department of the Interior, United States Fish Commission and Mr. Samuel H. Scudder, of Washington; Washburn College, Topeka, and the University of California.

Letters of envoy were read from La Société Nationale des Antiquaires de France (Paris); Geological Survey of India (Calcutta); Fondation de P. Teyler van der Hulst (Harlem); Ministère de l'Interieur (Bruxelles).

Letters of acknowledgment were read from Königliche Bibliothek, Berlin (117, 118, 119); K. K. Sternwarte, Prag (116); Harvard College Observatory, Cambridge, Mass. (Transactions IX); Chief Signal Officer U. S. A., Washington, D. C. (Proceedings 96–121; Transactions XV, XVI, i); Fondation van der Hulst, Harlem (Proceedings 117, 118, 119); Japetus Steenstrup, Copenhagen (116, 117, 118, 119); Royal Society of London (116); Royal Society of Victoria, Melbourne (114, 115).

Letters accepting membership in the Society were read from Prof. Guiseppe Sergi (Nov. 3, 1885; via Pastrengo 1, Roma, Italia); Prof. Louis Pasteur (Paris, Nov. 5, 1885); Prof. Ernst Haeckel, Jena, Nov. 4, 1885); Prof. Dr. Josef von Lenhossek (Buda Pesth, Nov. 4, 1885); Prof. J. Pomialowsky (St. Petersburg, Oct. 21, 1885); Dr. Hermann Rollett (Baden bei Wien, Nov. 5, 1885).

Letters acknowledging receipt of diploma were read from Lord Coleridge, London, England; Sir John Lubbock, High Elms, Hayes, Beckenham, England.

A letter was received from Dr. Asa Gray and Mr. C. S. Sargent, requesting permission to have a copy made of the diary of the elder Michaux, which was presented to the Society by his son in 1824. The request was granted, with the restriction that the copy was to be made in the Society's rooms under the supervision of the Librarian.

The Special Committee appointed October 16, 1885, to examine the paper on Iguanidæ presented by Prof. E. D. Cope, for the Transactions, reported it to be worthy, and recommended its publication with a suitable plate or plates.

On motion, the report was adopted, and the Committee discharged.

A letter was read from Prof. Cope, requesting that the paper should be printed in the Proceedings with a view to its more speedy publication.

The Secretaries stated that in the present condition of the publications of the Society, Prof. Cope's paper would be more speedily printed if, as originally intended, in the Transactions.

On motion of Dr. Frazer, it was resolved that the Secretaries be requested to inform Prof. Cope of the facts of the case, and to ascertain in which form he prefers that the paper shall appear.

The death of W. B. Carpenter (London, Nov. 11, 1885) was announced as having taken place in the seventy-third year of his age.

The President reported that, pursuant to resolution of the Society, he had appointed Prof. J. P. Lesley to prepare an obituary notice of the late James Macfarlane, and that Prof. Lesley had signified his willingness.

A letter was read from Prof. Weir Mitchell declining, for sufficient reasons, the appointment to prepare an obituary notice of the late George Leib Harrison.

Dr. Brinton presented a paper on the Mangue language.

Prof. Cope (through the Secretaries) presented the Thir-

teenth Contribution to the Herpetology of Tropical America.

Prof. Houston presented a paper on Photography by a Lightning Flash during the storm of October 29, 1885.

Dr. Frazer presented a résumé of the proceedings of the recent International Congress of Geologists held at Berlin, which he had attended as one of the delegates from the American Association for the Advancement of Science. Dr. Frazer exhibited an improved prismatic compass (made by Elliott, of London), and a device for printing boundary lines automatically, and explained their advantages.

Dr. Frazer also presented four track charts of the North Atlantic ocean, made in 1882, 1883 and 1885.

The minutes of the proceedings of the Board of Officers and Council were submitted.

Nominations Nos. 1064, 1065, 1066, and new nominations Nos. 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, were read.

The Committee of Finance, to which was referred the application for a plate for Prof. Cope's paper on the brain of a Theromorphous reptile, reported that the Society had in hand funds sufficient for that purpose. The Committee stated that its business was not to pass upon the merits or desirability of any such application, but only upon the question if the Society had funds available for such a purpose. That the ordering of the plates was at the discretion of the Secretaries in their disbursement of the annual appropriation made by the Society for its publications.

On motion, the plate was ordered by the Society at estimate price, furnished by Breuker & Kessler.

Dr. Frazer exhibited the Geological-Geographical Dictionary of Señor Juan de Villa Nueva y Piera, and *L'Annuaire Geologigue Universelle* of D'Agincourt, and offered the following resolution, which was adopted:

***Resolved*, That a Committee, consisting of Prof. Lesley, Prof. Cope, Mr. Franklin Platt, Mr. C. A. Ashburner and Dr. Frazer be appointed to consider the propriety of assisting the International Geological Congress**

in extending the works of MM. Villa Nueva and Neumayer, and the means of doing so, and that the Committee be requested to report to the Society at as early a date as possible.

And the meeting was adjourned by the President.

Stated Meeting, December 4, 1885.

Present, 16 members.

President, Mr. FRALEY, in the Chair.

Dr. Horace Jayne, a newly-elected member, was presented to the Chair, and took his seat.

Donations for the Library were received from the Naturforschende Gesellschaft and the Zoölogischer Anzeiger, Leipzig; K. P. Akademie der Wissenschaften, Berlin; Société de Géographie and L'Alliance Scientifique Universelle, Paris; Nature; Society of Antiquaries, London; Canadian Institute; Geological and Natural History Survey of Canada; Boston Society of Natural History; Museum of Comparative Zoölogy, Cambridge; Mr. Charles S. Sargent, of Brookline, Mass.; Yale College; American Chemical Society and the New York Academy of Sciences; Mr. W. J. Potts, of Camden, N. J; Franklin Institute, the American Fire Insurance Co., Drs. W. S. W. Ruschenberger and Persifor Frazer, Messrs. Alex. E. Harvey, Henry Phillips, Jr., McCalla & Stavely, and Francis Jordan, Jr., of Philadelphia; Johns Hopkins University, Baltimore; United States National Museum, United States Geological Survey and the Chief Signal Officer of the United States Army, Washington, D. C.; Mr. Jed. Hotchkiss, of Staunton, Va., and Mr. G. W. Hough, of Chicago.

Letters of envoy were read from the Canadian Institute, Toronto; the Johns Hopkins University, Baltimore; U. S. Geological Survey, Washington, D. C.

Letters of acknowledgment were read from the Statistical Society, London (117, 118, 119); the Smithsonian Institution, Washington, D. C. (120); Annales des Mines (97–120); Royal Society of Edinburgh (116, 117, 118, 119).

Letters accepting membership in the Society were read from Horace Jayne, M.D. (Phila., 1826 Chestnut St., November 26, 1885), Gaston Planté (Paris, April 12, 1885).

A letter was read from Prof. Lesley declining the appointment as chairman of the committee appointed at the last meeting on the works of Villa Nueva and Neumayer.

A circular was read from the Trustees of the "Elizabeth Thompson Science Fund," calling attention to the provisions under which the fund was administered.

Prof. Frazer, from the Committee on the Works of Villa Nueva and Neumayer, reported progress.

An obituary notice of the late James Macfarlane, prepared by Prof. J. P. Lesley, was read by the Secretaries.

A MS. record book of the Wistar Association, 1824–1839, was returned to the Society by Prof. Lesley, with a letter stating he had just discovered it among a mass of papers.

Dr. Frazer presented a paper entitled a Résumé of the Geology of York County, Pa.

The Treasurer presented his annual report, which was referred to the Committee on Finance.

The Board of Officers and Council submitted certain proposed changes in the Laws and Regulations of the Society, which were read, and under the laws laid over until December 18, 1885.

Pending nominations Nos. 1067–1075 were read.

On motion, permission was given to Prof. Cope to withdraw his paper on Iguanidæ, presented and accepted for the Transactions, and the Secretaries were requested to add to it his paper "Thirteenth Contribution to the Herpetology of Tropical America."

And the meeting was adjourned by the President.

Stated Meeting, December 18, 1885.

Present, 21 members.

President, Mr. FRALEY, in the Chair.

Mr. Francis Jordan, Jr., a lately-elected member of the Society, was presented to the Chair and took his seat.

Donations for the Library were received from Prof. J. Pomialowsky, of St. Petersburg; the Astronomische Nachrichten, Kiel; Zoölogischer Anzeiger, Leipzig; Flora Batava, Leiden; the Académie R. de Belgique; R. Accademia dei Lincei, Roma; Ecole des Mines and Société de Geographie, Paris; R. Academia de la Historia, Madrid; Geological Society, Meteorological Council, Journal of Forestry, and Nature, London; Philological Society, Cambridge, England; the publishers of the American Architect and Every Other Saturday, Boston; American Journal of Science; the publishers of the Critic; Brooklyn Entomological Society; Brooklyn Library; College of Pharmacy, Messrs. Edward L. Wilson, Henry Phillips, Jr., and R. S. Culin, Drs. W. S. W. Ruschenberger and Charles A. Oliver, and the executors of Mr. Henry Seybert, of Philadelphia; Second Geological Survey of Pennsylvania; Johns Hopkins University, editors of the Journal of Philology, and the Chemical Journal, Baltimore; the War Department and the United States Coast and Geodetic Survey; editors of the Hoosier Naturalist, Valparaiso, Ind.; Rev. Stephen D. Peet, of Chicago, Ill.; the Iowa State Historical Society; University of California; Observatorio Astronomico Nacional de Tacubaya, and the Muséum National de Rio de Janeiro.

Letters of envoy were received from the R. Society of Melbourne, Australia; the Meteorological Commission, London; the Philosophical Society of Cambridge; the Canadian Institute, Toronto, Canada.

A circular was read from the Nat. Hist. and Physical Society of Geneva, with the conditions of the *De Candolle* prize.

A circular was read from Stearns & Co., Detroit, Mich.,

offering for sale a collection of South American antiquities and inviting bids for the same.

The deaths of Dr. Albert H. Smith (December 14, 1885, æt. 51), and Henry S. Hagert, Esq. (December 18, 1885, æt. 52), were announced and, on motion, the President was authorized to appoint suitable persons to prepare their obituary notices.

Prof. Cope presented for the Transactions a paper by Miss Helen C. de S. Abbott, entitled "A Chemical Study of *Yucca angustifolia*," which was referred for examination to a committee consisting of Drs. Brinton, Genth and Houston.

Prof. Cope made a communication to the Society on the subject of the physical conditions of memory.

Nominations Nos. 1064–1075 were read.

The proposed change in the Laws and Regulations of the Society, submitted by the Board of Officers and Council at the last meeting, were taken up, and proof having been made that advertisements had been inserted in two daily Philadelphia newspapers, and that full notice had also been sent to the resident members of the Society, and it appearing that a quorum of at least three of the Officers and Council, and at least thirteen members of the Society were present, the Society proceeded to the consideration of the proposed alterations, which, after discussion, were unanimously adopted, as follows:

That Chapter I, Section 1, shall read as follows:

"The election of members shall be by ballot, and shall form part of the stated business of the meetings on the third Fridays of February, May, October and December."

That Chapter I, Section 5, shall read as follows:

"The names of the candidates and their places of abode shall be designated on the ballots. In voting, the names of the officers shall be called in the order of their seniority by the acting Secretary, the members thereafter depositing their ballots. The name of a candidate struck from any ballot or not voted for, shall be considered as a vote adverse to that candidate."

That Chapter I, Section 6, shall read as follows:

"After all the other business of the meeting shall have been disposed of, the ballot-box shall be opened by the Secretaries, or in their absence by two Tellers to be appointed by the presiding member, who shall then declare to the Society the result of the poll."

That chapter I, Section 13, be struck out.

That Chapter VII, Section 1, shall read as follows:

"The Officers and Council shall meet together statedly on the second Friday of February, May and November, respectively, at the same hour in the evening at which the stated meetings of the Society are appointed to be held, and specially at such times as they may judge proper."

That Chapter VIII, Section 5, shall read as follows:

"He shall give notice of the meetings of the Society and of the Officers and Council, and of all elections, and shall make all such publications on behalf of the Society as are not otherwise devolved by law or special order."

That Chapter IX, Section 1, shall read as follows:

"The ordinary meetings of the Society shall be on the first and third Fridays of every month from September to June at 8 o'clock in the evening. Special meetings may be called at any time by order of the President, or in case of his absence or disability, by order of a Vice-President. And it shall not be lawful to take up, consider or transact at such special meeting any business other than that which is specified in the call and the notice for the meeting. And no business shall be taken up, considered or transacted at such special meeting, except by such number of qualified voters as would be requisite for a quorum, according to the Laws and Regulations of the Society."

That Chapter IX, Section 2, shall read as follows:

"The Chair shall be taken by the presiding member at the hour appointed for the meeting."

That Chapter IX, Section 6, shall read as follows:

"The Hall of the Society shall be open on every stated meeting at half-past seven o'clock in the evening."

That the item "stated business of the meeting" in the Rules of Order (p. 19, Edition 1866) shall be transposed so as to immediately follow "Obituary notices of members read and announcements of the decease of members made and acted on;" and that the numbers prefixed to the respective items in the said order of business be altered to correspond with the said change.

That Section 12 of the said Rules of Order (p. 20, Edition 1866) be struck out and the following section be numbered 12.

Mr. Phillips presented a list, which he had prepared, of Officers and Councilors of the Society from 1769 to 1886, which was ordered to be printed.

On motion, the Secretaries were directed to have the Laws and Regulations of the Society, as adopted this evening, printed for the use of the members.

The report of the Finance Committee was presented and accepted and the appropriations passed for the year 1886.

And the meeting was adjourned by the President.

Stated Meeting, January 1, 1886.

Present, 11 members.

President FRALEY, in the Chair.

Donations for the Library were received from the Royal Observatory, Cape of Good Hope; Asiatic Society of Japan; Anthropologische Gesellschaft, Wien; Deutsche Gesellschaft für Anthropologie, &c., München; Astronomische Nachrichten, Kiel; Zoölogische Anzeiger, Leipzig; Archives Neèrlandaises, Hærlem; R. Accademia dei Lincei, Rome; Osservatorio della Università di Torino; Société de Géographie, Société d'Anthropologie, Musée Guimet, Institut de France and Ecole des Mines, Paris; the Royal Society, Zoölogical Society, Geological Society, Royal Meteorological Society, the Lords Commissioners of the Admiralty, Meteorological Council, Greenwich Observatory and Nature, London; Canadian Institute; Mr. Parker Pillsbury of Concord, N. H.; the publishers of the American Architect and Every Other Saturday, Boston; Meteorological Observatory, New York; Journal of Medical Sciences, Dr. J. W. Holland, Prof. E. D. Cope, Messrs. Henry Phillips, Jr., E. A. Barber and R. S. Culin, Philadelphia; Johns Hopkins University, Baltimore; Philosophical Society, Washington; the War Department, National Academy of Sciences, United States Coast and Geodetic Survey and the Bureau of Ethnology, Washington, D. C.; State Board of Health, Tennessee; Prof. H. S. Frieze of Ann Arbor, Mich.; Nebraska State Historical Society; Mr. Wm. M. Stewart of San Francisco; publisher of the West-American Scientist, San Diego, Cal.; and the Observatorio Meteorológico-Magnético Central de México.

The Société Entomologique de Belgique (by letter dated Bruxelles, Dec. 9, 1885), requested exchanges. On motion, it was placed upon the list to receive Proceedings from No. 96.

Geological Society of Glasgow, by letter requested certain missing numbers of the Proceedings, which was referred to the Secretaries with power to act.

Letters of envoy were read from the U. S. Coast and Geodetic Survey; U. S. Bureau of Ethnology; La Société Hollandaise des Sciences, Hærlem.

Mr. Everard F. im Thurn, of British Guiana, accepted membership by letter dated Torquay, England, Dec. 19, 1885.

The President reported that he had appointed Dr. Harrison Allen to prepare obituary notice of the late Dr. A. H. Smith, and Mr. Henry Phillips, Jr., of the late Henry S. Hagert, Esq., and that both had accepted the appointment.

The death of Samuel Birch, LL.D. (London, Dec. 29, 1885), in the 72d year of his age, was announced.

The judges of the annual election reported that the following officers and council had been elected for the year 1886, viz:

President,

Frederick Fraley.

Vice-Presidents,

E. Otis Kendall, Pliny E. Chase, W. S. W. Ruschenberger.

Secretaries,

J. P. Lesley, G. F. Barker, D. G. Brinton, Henry Phillips, Jr.

Councilors,

Oswald Seidensticker, Richard Wood, Wm. V. McKean, Persifor Frazer.

Councilor for one year, in lieu of W. S. W. Ruschenberger, resigned,

Thomas H. Dudley.

Curators,

Geo. H. Horn, Charles G. Ames, John R. Baker.

Treasurer,

J. Sergeant Price.

On motion, Henry Phillips, Jr., Esq., was renominated for Librarian, and the nominations were closed.

Prof. Cope presented for the Transactions a paper "On the Intercentrum of the Terrestrial Vertebrata," which was referred to Dr. H. Allen, Dr. H. Jayne, and Dr. Geo. H. Horn.

Prof. Allen made a communication on the result of experiments on electric light used in photographing animals in motion.

Prof. Cope presented for the Proceedings a paper by Dr. Alfredo Dugês of Guanajuato, *Sur le Rhinocheilus Antonii*.

Pending nominations Nos. 1064–1075 and new nominations Nos. 1076 –1080 were read.

Report of the Publication Committee presented November 6th, 1885, was taken up and considered, and the recommendations therein contained were unanimously adopted, as follows:

1. That the Quarterly numbers of the Proceedings shall be confined as nearly as possible to 125 pp. each.

2. That papers containing more matter than will fill about 24 pp. of the Proceedings shall be considered as offered for the Transactions.

3. That all papers requiring engravings or plates of full page size shall be considered as offered for the Transactions.

The committee appointed at last meeting on the paper on *Yucca angustifolia*, reported progress and was continued.

After the reading of the rough minutes the meeting was adjourned by the President.

Stated Meeting, January 15, 1886.

Present, 25 members.

President FRALEY, in the Chair.

Letters of envoy were received from the Societas pro Fauna et Flora Fennica, Helsingfors; Bataafsch Genootschap der Proefondervindelijke Wijsbegeerte, Rotterdam; Royal Society of Victoria; Société de Naturalistes de la Nouvelle Russie, Odessa,

and asking for exchanges (on motion, ordered to be placed on the list to receive Proceedings from No. 96).

Acknowledgments were received from the Royal Society of Tasmania for Proceedings Nos. 114, 115, 116; Proc. 120, South Kensington Museum, London; University Library, Cambridge; Radcliff Observatory, Oxford, also for five duplicate volumes of its publications returned to the Observatory; Trübner & Co., London.

Acknowledgments for Proceedings No. 121, were received from the Portland Society of Natural History; New Hampshire Historical Society; Essex Institute; American Antiquarian Society, Worcester, Mass.; Rhode Island Society for the Encouragement of Domestic Industry; Connecticut Historical Society; New York Hospital; Library of the U. S. Military Academy; Vassar Brothers' Institute; New Jersey Historical Society; Numismatic and Antiquarian Society of Philadelphia; Engineers' Club of Philadelphia; Historical Society of Pennsylvania in Philadelphia; Wyoming Historical and Geological Society; Virginia Historical Society; University of Virginia; Leander McCormick Observatory; Georgia Historical Society; Cincinnati Observatory; Chicago Historical Society; Rantoul Literary Society; State Historical Society of Wisconsin; Chief Signal Officer, Washington, D. C.; California Academy of Sciences; University of California; Davidson Observatory, San Francisco, Cal.

The Davenport Academy of Natural Sciences acknowledged the receipt of Proceedings No. 121, also preceding numbers, commencing with No. 81.

Acknowledgments for Proceedings No. 121 were received from Prof. Charles Henry Hitchcock, Hanover, N. H.; Hon. R. C. Winthrop, Boston, Mass.; Prof. Walcott Gibbs, Cambridge, Mass.; Mr. James B. Francis, Lowell, Mass.; Mr. Benj. Smith Lyman and Dr. Pliny Earle, Northampton, Mass.; Drs. J. J. Stevenson and Austin Flint, Jr., Prof. Henry M. Baird and Mr. J. Ericsson, New York; Prof. James Hall, Albany; Prof. T. F. Crane, Ithaca; Dr. C. F. H. Peters, Clinton, N. Y.; Rev. Joseph F. Garrison and Mr. William J. Potts, Camden; Dr. G. D.

Boardman, Prof. J. P. Lesley, and Messrs. Henry Phillips, Jr., James C. Booth, Isaac Norris, Jr., H. Clay Trumbull, and Russell Thayer, Philadelphia; Dr. Henry Hartshorne and Mr. Thomas Meehan, Germantown; Hon. Washington Townsend, West Chester; Andrew S. McCreath, Harrisburg; Prof. J. W. Moore, Easton; Prof. Leo Lesquereux, Columbus; Professors Henry Turner Eddy and James Morgan Hart, Cincinnati; Prof. Robert Peter, Lexington; Prof. Henry S. Frieze, Ann Arbor; Prof. Joseph L. LeConte, Berkeley, Cal.

Photographs for the Society's Album were received from Prof. J. Morgan Hart and Prof. H. Turner Eddy of Cincinnati, Ohio; Prof. James Hall of Albany, N. Y.; Prof. James C. Booth, Philadelphia.

Donations for the Library were received from the Royal Society of New South Wales; Mining Department, Melbourne; Royal Society of Victoria; Hong-Kong Observatory; Société des Naturalistes de la Nouvelle Russie, Odessa; Society of Naturalists, Riga; Society for the Finnish Fauna and Flora, Helsingfors; Prof. R. F. Rerleaux of Vienna; the Astronomische Nachrichten, Kiel; Statistika Central Byrån, Stockholm; Bataafsch Genootschap van Proefondervendelijke Wijsbegeerte, Rotterdam; K. Bibliothek, S'Gravenhage; Bataviaasch Genootschap van Kunsten en Wetenschappen, Batavia; Musée Royale d'Histoire Naturelle de Belgique; R. Accademia dei Lincei, Rome; Muséum d'Histoire Naturelle, Société de Geographie and Société Americaine de France, Paris; Journal of the Society of Arts, Nature, London; Royal Irish Academy, Dublin; Mr. W. Douw Lightfall and the Natural History Society of Montreal; Boston Society of Natural History; Prof. Eben Norton Horsford of Cambridge, Mass.; American Journal of Science, New Haven; Essex Institute, Salem, Mass.; American Chemical Society and New York Academy of Sciences; Brooklyn Entomological Society; Prof. E. North of Clinton, N. Y.; New Jersey Historical Society; Library Company of Philadelphia; Franklin Institute, Pennsylvania Museum and School of Industrial Art, the American Naturalist and Messrs. Henry Phillips, Jr., E. A. Barber, R. S. Culin and Wm. V.

McKean of Philadelphia; Prof. Ira Remsen of Baltimore; Naval Institute, Annapolis; Mr. J. H. Hickcox, the United States Naval Observatory and the Light-house Board, Washington; Mr. Jed. Hotchkiss of Staunton, Va.; and the Cincinnati Society of Natural History.

The Committee appointed to examine the paper of Prof. Cope on the Intercentrum of the Vertebrata, reported it worthy of publication in the Transactions. The report was accepted and the Committee discharged.

The Committee appointed to examine Miss Helen C. de S. Abbott's paper on *Yucca angustifolia*, reported in favor of its publication, and was discharged.

On motion, the Society ordered the publication of both of the above papers in its Transactions.

The death of Joshua B. Lippincott was announced as having taken place at Philadelphia on January 5, 1886, in the seventy-fourth year of his age, and, on motion, the President was authorized to appoint at his discretion a suitable person to prepare the usual obituary sketch.

The stated business of the meeting was then taken up and Henry Phillips, Jr., Esq., was re-elected Librarian for the ensuing year, and the following Standing Committees appointed:

Finance,

Henry Windsor, J. P. Wetherill, W. B. Rogers.

Publication,

D. G. Brinton, C. M. Cresson, George H. Horn, Persifor Frazer, J. Blodgett Britton.

Hall,

J. Sergeant Price, Wm. A. Ingham, Philip H. Law.

Library,

Henry Phillips, Jr., E. J. Houston, Wm. V. McKean, Thomas H. Dudley, John R. Baker.

Mr. Lesley read a paper "On the evident Beduwin origin of the *Shedi* deity in the Hebrew Scriptures, commonly translated

'the Almighty'"; in which he discussed every text in which it occurs, and drew the conclusion that it bore a manifest relationship to the deity *Seti*, introduced into Egypt and into Palestine from Arabia.

After which, a discussion ensued participated in by Messrs. Weil, Law, Trumbull, and Garrison.

Mr. Lesley communicated a revision of the section of the LeRoy (Chemung) beds in Bradford county, originally read before the Society, Dec. 7, 1883, giving additions to the list of its fossils and extending it downwards nearly 350 feet, to include a horizon very rich in characteristic forms.

Mr. Ashburner made a verbal communication in reference to the late severe storm which began here on Friday, January 8th, and was general over the United States, showing the course of the barometer during its progress.

Dr. Persifor Frazer made a communication on the application of composite photography to handwriting for which, on motion, the Society ordered a plate to cost about $25.

The Society ordered that a map to illustrate the paper on the Geology of York county should be printed at a cost of about $40.

Dr. Harrison Allen exhibited a specimen of the *Chlamyphorus truncatus* from Mendoza in the Andes, which is now rapidly becoming extinct. He stated that it was described in the Transactions of the Society by Dr. Harland about the year 1825.

On account of the lateness of the hour, nominations for membership were not read, and, after reading the rough minutes, the Society was adjourned by the President.

Stated Meeting, February 5, 1886.

Present, 9 members.

Curator, Dr. HORN, in the Chair.

Donations were announced from the following: Sälskap. Fauna et Flora Fennica, Helsingfors; Astronomische Nachrichten, Kiel; Zoologischer Anzeiger, Leipzig; Verein für Erdkunde, Dresden; Senckenbergische Naturforschende Gesell-

schaft and Verein für Geographie und Statistik, Frankfurt-am-Main; Fondation Teyler, Harlem; Académie Royale de Belgique; Société Royale des Antiquaires du Nord, Copenhagen; Statistika Central Byrån, Stockholm; R. Accademia dei Lincei, Rome; Société de Geographie, École Polytechnique and Société Linnéene de Paris; R. Academia de la Historia, Madrid; Royal Astronomical and Geographical Societies, Meteorological Council, Kew Observatory, Journal of Forestry, Nature, London; Radcliffe Observatory, Oxford; American Academy and Boston Society of Natural History; Harvard University and Professors Eben Norton Horsford and B. M. Everhart of Cambridge, Mass.; American Antiquarian Society, Worcester; American Journal of Science, New Haven; New York Historical Society, American Oriental Society and Prof. J. S. Newberry of New York; Franklin Institute, Numismatic and Antiquarian Society, College of Pharmacy, Editors of The American Naturalist, Indian Rights Association, Mr. Henry Phillips, Jr., and Dr. Isaac Lea, of Philadelphia; Johns Hopkins University and the American Journal of Archæology, Baltimore; United States Geological Survey and the Anthropological Society of Washington; Prof. Henry S. Frieze of Ann Arbor, Mich.; and the Editors of The West-American Scientist, San Diego, Cal.

Dr. Pliny Earle presented an engraving of himself for the Society's Album.

Letters of envoy were received from Societas pro Fauna et Flora Fennica, Helsingfors, Finland; Royal Society of Northern Antiquaries, Copenhagen; Fondation Van der Hulst, Haarlem, Holland; Meteorological Office, London, England; U.S. Geological Survey, Washington; Prof. Henry S. Frieze, Ann Arbor, Mich.

The Physikalisches Central-Observatorium, St. Petersburg, requested by letter Proceedings No. 109, which, on motion, was granted. A circular announcing the programme of the U. S. Naval Observatory for the year 1886 was submitted. A letter was read from Henry M. Hugunin (Chicago, Jan. 26, 1886), suggesting that the beginning of the year should more properly be taken from December 21st, as on that day the southward

march of the sun is terminated and its journey to the north begins.

Acknowledgments were received for Proceedings No. 121 from the Museum of Comparative Zoölogy (Cambridge, Mass.); Messrs. Isaac Burke and Lewis A. Scott (Philadelphia); U. S. Naval Institute, Annapolis; J. H. C. Coffin, Surgeon-General's Office, U. S. Geological Survey, Smithsonian Institution (Washington); Prof. Henry S. Frieze (Ann Arbor, Mich.); State Historical Society of Wisconsin; John F. Carll (Pleasantville, Pa.); also from the Philosophical Society of Cambridge (England), for No. 120; Annales des Mines, Paris (117, 118, 120).

Dr. A. S. Gatschet (Washington, D. C.), by letter, acknowledged the receipt of his diploma.

Prof. Cope presented for the Transactions a paper on the structure and affinities of the Amphiuma, which was referred to Dr. Harrison Allen, Dr. George H. Horn, and Mr. Charles A. Ashburner to examine.

For the Proceedings were presented a paper from Dr. Hoffman of Washington, on some Indian Tribal Names, and a paper by Prof. A. S. Packard of Providence, R. I., on the discovery of thoracic feet in a carboniferous Phyllocaridan.

Dr. Horn exhibited sketches of Chrysobotheris and anatomical details.

Nominations Nos. 1064 to 1080 were read.

On motion, the Society resolved to appoint a committee to revise its work and to examine into its condition and suggest what, if any, measures are necessary to increase its efficiency. The Chair was desired to announce the committee at the next meeting of the Society.

On motion of Prof. Cope it was resolved that the Secretaries be requested to publish the proceedings and papers read before the Society in each year, so far as practicable, within the volume for that year.

On motion of Prof. Cope the Committee on Publication was requested to report on the desirability of increasing the size of the edition of the Transactions from 500 to 1000.

The rough minutes were read and the Society was adjourned by the presiding officer.

Stated Meeting, February 19, 1886.

Present, 19 members.

President, Mr. FRALEY, in the Chair.

Donations were received from the following: Geological Survey of India; Magyar Tudományos Akademie, Budapesth; Numismatische Gesellschaft, Wien; Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, Munich; Astronomische Nachrichten, Kiel; Zoölogischer Anzeiger, Leipzig; Naturforschende Gesellschaft, Frieburg; R. Accademia dei Lincei, Rome; École des Mines and Société de Geographie, Paris; R. Academia de la Historia, Madrid; Royal Geographical Society, Journal of Forestry, "The Asclepiad" and "Nature," London; Royal Geographical Society of Ireland; Harvard University; Rhode Island Historical Society; New York Academy of Sciences and the Astor Library; Brooklyn Entomological Society; College of Pharmacy, Dr. Daniel G. Brinton and Messrs. W. S. Baker, Henry Phillips, Jr., and Charles A. Ashburner, of Philadelphia; Second Geological Survey of Pennsylvania; War Department, Department of the Interior, Bureau of Education and U. S. Commission of Fish and Fisheries, Washington, D. C.; State Board of Health of Tennessee; Chicago Historical Society, and the California Academy of Sciences.

Letters of envoy were received from the Magyar Tudomanyos Akademie (Buda-Pesth), and the California Academy of Sciences, San Francisco.

Letters of acknowledgment were received from the Naturforschende Gesellschaft, at Emden.

A letter was read from the California Academy of Sciences enclosing a list of its duplicates for sale.

An obituary notice of the late George Whitney, written by Mr. William Sellers, was read by the Secretaries.

The Committee on Prof. Cope's paper, appointed at the last meeting of the Society, reported progress, and was continued.

The President announced that he had appointed as the com-

mittee which he was authorized to appoint by resolution of Dr. Frazer, at the last meeting, Dr. Frazer, Mr. Law, Dr. Horn, Dr. Brinton and Mr. McKean.

Dr. Frazer from the committee reported progress, and the committee was continued.

The minutes of the Board of Officers and Council were submitted to the Society.

This being the regular evening for balloting for members, an election was held, and the following persons were declared duly elected members of the Society.

2059. Dr. Edward Pepper, Paris.
2060. Prof. Serge Nikotin, St. Petersburg.
2061. Lieut. A. B. Wyckoff, U. S. Navy.
2062. Lieut. A. B. Murdock, U. S. Navy.
2063. Ensign Louis Duncan, U. S. Navy.
2064. Lieut. George B. Anderson, U. S. Army, West Point, N. Y.
2065. Robert Noxon Toppan, Cambridge, Mass.
2066. Prof. Hermann A. Hagan, Cambridge, Mass.
2067. Prof. F. A. Genth, Jr., Philadelphia.
2068. Prof. J. W. Holland, M.D., Philadelphia.
2069. Prof. John H. Brinton, M.D., Philadelphia.
2070. Inman Horner, Philadelphia.
2071. I. Minis Hays, M.D., Philadelphia.
2072. Charles A. Oliver, M.D., Philadelphia.

A paper was presented through the Secretaries by Prof. John C. Branner, entitled, "*The Glaciation of the Wyoming and Lackawanna Valleys*," for which the Society ordered two maps.

Prof. Cope presented through the Secretaries a paper on Two new species of three-toed Horses from the Upper Miocene, with notes on the Fauna of the Ticholeptus beds.

New nominations Nos. 1078, 1079, 1080 and 1081 were read.

The President reported that he had received and paid over to the Treasurer, $133.07, the amount of the *Michaux rentes* due January 1st, 1886.

The minutes were read, and the meeting was adjourned by the President.

Stated Meeting, March 5, 1886.

Present, 22 members.

President, Mr. FRALEY, in the Chair.

Dr. I. Minis Hays, Dr. John W. Holland and Mr. Inman Horner, newly-elected members, were present and took their seats.

Donations were announced from Anthropologische Gesellschaft, Wien; Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, München; Astronomische Nachrichten, Kiel; Zoölogischer Anzeiger, Leipzig; Academie Royale de Belgique; Société Americaine de France and Institution Ethnographique, Paris; Royal Society, Meteorological Council, Royal Astronomical Society, and "Nature," London; American Academy of Arts and Sciences, Boston; American Journal of Science, New Haven; American Chemical Society, and the publisher of "The Forum," New York; Hon. Thomas H. Dudley, Camden, N. J.; Academy of Natural Sciences; Mercantile Library; publishers of the American Naturalist; Messrs. William Dennis Marks, William S. Auchincloss, Samuel Wagner, Henry Phillips, Jr., and Hon. Richard Vaux, Philadelphia; Mr. Waters S. Chillson, Palo Alto, Penna.; Mr. H. B. Plumb, Peely, Penna.; Johns Hopkins University, Baltimore; Chemical Society, Bureau of Education, Census Office and United States Geological Survey, Washington; State Historical Society, Iowa, and University of California.

Letters were read from the Laboratory of Natural History and Biology of Dennison University, Granville, Ohio, requesting exchanges, which, on motion, was so ordered, to begin with No. 121 of the Proceedings; from Rev. T. P. Hughes requesting the subscription of the Society to his Dictionary of Islam.

Letters accepting membership were read from Lieut. J. B. Murdock, U. S. Navy (Norfolk, Va., Feb. 27th, 1886); Dr. H. A. Hagan (Cambridge, Mass., Feb. 26th, 1886); Robert N.

Toppan (Cambridge, Mass., Feb. 22, 1886); Lieut. A. B. Wyckoff, U. S. Navy (Philadelphia, Feb. 24th, 1886); Dr. Charles A. Oliver (Philadelphia, Feb. 20th, 1886); Dr. I. Minis Hays (Philadelphia, Feb. 20th, 1886); Dr. J. W. Holland (Philadelphia, Feb. 24th, 1886); Dr. John H. Brinton (Philadelphia, Feb. 24, 1886); Inman Horner (Philadelphia, March 2, 1886).

Letters of envoy were read from the U. S. Geological Survey; Wm. S. Auchincloss, C. E., Philadelphia.

Letters of acknowledgment were read from Observatorio Nacional, Mexico (Proceedings 120); Statistical Society, London (Proceedings 119); Société de Physique et Histoire Naturelle de Geneva (Proceedings 115, 116); Maryland Historical Society (Proceedings 121).

The Committee on Prof. Cope's paper was, on motion, continued.

Mr. Henry Phillips, Jr., presented an alphabetical list of the living members of the Society which he had been requested to prepare by the Board of Officers and Council.

The Treasurer presented the report of the Trustees of the Building Fund.

The Special Committee appointed on February 5, 1886, "to revise the work of the Society, and to examine into its condition, and to suggest, what, if any, measures are necessary to increase its efficiency," made a report, which, after discussion, on motion of Mr. McKean was referred to the Board of Officers and Council for its consideration, and, on motion, the committee was discharged.

Pending nominations Nos. 1078, 1079, 1080 and 1081 were read.

New nominations Nos. 1082–1103 were read.

The rough minutes were read, and the meeting was adjourned by the President.

him the communication, description, or model, except the officer to whom it shall be entrusted; nor shall such officer part with the same out of his custody, without a special order of the Society for that purpose.

6. The Society, having previously referred the several communications from candidates for the premium, then depending, to the consideration of the twelve counsellors and other officers of the Society, and having received their report thereon, shall, at one of their stated meetings in the month of December, annually, after the expiration of this current year (of the time and place, together with the particular occasion of which meeting due notice shall be previously given, by public advertisement) proceed to final adjudication of the said premium; and, after due consideration had, a vote shall first be taken on this question, viz.: Whether any of the communications then under inspection be worthy of the proposed premium? If this question be determined in the negative, the whole business shall be deferred till another year; but if in the affirmative, the Society shall proceed to determine by ballot, given by the members at large, the discovery, invention or improvement most useful and worthy; and that discovery, invention, or improvement which shall be found to have a majority of concurring votes in its favor shall be successful; and then, and not till then, the sealed letter accompanying the crowned performance shall be opened, and the name of the author announced as the person entitled to the said premium.

7. No member of the Society who is a candidate for the premium then depending, or who hath not previously declared to the Society, that he has considered and weighed, according to the best of his judgment, the comparative merits of the several claims then under consideration, shall sit in judgment, or give his vote in awarding the said premium.

8. A full account of the crowned subject shall be published by the Society, as soon as may be after the adjudication, either in a separate publication, or in the next succeeding volume of their Transactions, or in both.

9. The unsuccessful performances shall remain under consideration, and their authors be considered as candidates for the premium for five years next succeeding the time of their presentment; except such performances as their authors may, in the meantime, think fit to withdraw. And the Society shall annually publish an abstract of the titles, object, or subject matter of the communications, so under consideration; such only excepted as the Society shall think not worthy of public notice.

10. The letters containing the names of authors whose performances shall be rejected, or which shall be found unsuccessful after a trial of five years, shall be burnt before the Society, without breaking the seals.

11. In case there should be a failure, in any year, of any communication worthy of the proposed premium, there will then be two premiums to be awarded the next year. But no accumulation of premiums

shall entitle the author to more than one premium for any one discovery, invention or improvement.

12. The premium shall consist of an oval plate of solid standard gold of the value of ten guineas. On one side thereof shall be neatly engraved a short Latin motto suited to the occasion, together with the words: "The Premium of John Hyacinth de Magellan, of London, established in the year 1788;" and on the other side of the plate shall be engraved these words: "Awarded by the A. P. S. for the discovery of———A.D.———." And the seal of the Society shall be annexed to the medal by a ribbon passing through a small hole at the lower edge thereof.

SECTION 2. The Magellanic fund of two hundred guineas shall be considered as ten hundred and fifty dollars, and shall be invested separately from the other funds belonging to or under the care of the Society, and a separate and distinct account of it shall be kept by the treasurer.

The said fund shall be credited with the sum of one hundred dollars, to represent the two premiums for which the Society is now liable.

The treasurer shall credit the said fund with the interest received on the investment thereof, and, if any surplus of said interest shall remain after providing for the premiums which may then be demandable, said surplus shall be used by the Society for making publication of the terms of the said premium, and for such purposes as may be authorized by its charter and laws.

The treasurer shall, at the first stated meeting of the Society in the month of December annually, make a report of the state of said fund and of the investment thereof.